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ADVANCED CONCEPTS OF NAVAL ENGINEERING MAINTENANCE TRAINING

VOLUME II. APPENDIX F

ESSEX CORPORATION

PREPARED FOR
NAVAL TRAINING EQUIPMENT CENTER

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ADVANCED CONCEPTS OF NAVAL ENGINEERING MAINTENANCE TRAINING

VOLUME II of II

ESSEX CORPORATION
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Alexandria, Virginia 22314

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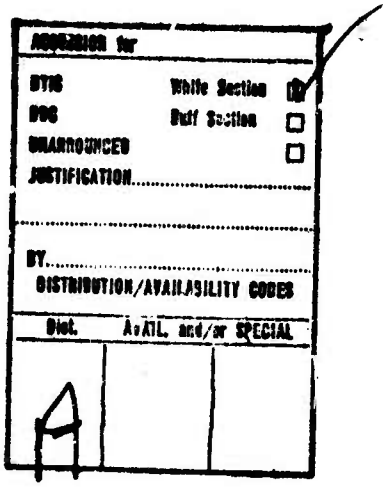

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This study was concerned with the feasibility of applying various recent advances in instructional technology to maintenance training in the area of marine engineering. The study is divided into four principal sections: requirements analysis, media selection, training system description, and system development planning.

The requirements analysis identified all requirements which affect decisions concerning the use of instructional technology. Baseline job

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requirements were established for a representative course of maintenance instruction, the Hagan Automatic Boiler Control (ABC) course. These job requirements also included the tasks, skills, and knowledges for all relevant Hagan ABC maintenance functions.

This analysis was also utilized in the establishment of course requirements including course phasing requirements and course content segmentation. Finally, training system requirements were developed which identified system capabilities required to meet course requirements.

The media selection technique which was developed for this study is a procedure for evaluating candidate media/method approaches in terms of relative effectiveness, usability, and dollar cost. The delphi method was used to rate alternate media on specific criteria, to establish the relative importance (weighting) of criteria for each training objective, and to integrate the ratings and importance weights.

The proposed engineering maintenance training system incorporates an audiovisual element and a programmable, modular simulator. A set of functional specifications and software requirements for the proposed system were developed.

SUMMARY

This Appendix presents the results of analyses to develop operational sequences and training requirements for:

- Fault analysis and troubleshooting
- Hot and cold plant inspection
- Planned maintenance

It was planned to analyze the calibration and repair area, but data for that analysis were not available

SKILL TAXONOMY

MOTOR SKILL (MOT)	Involves a mechanical manipulation of tools or controls
PERCEPTUAL SKILL (PER)	Involves assimilation information from display or indications
PERCEPTUAL MOTOR SKILL (PER-MOT)	Involves assimilating information from display or indications while manipulating controls
MEMORY SKILL (MEM)	Capacity to recall set points ranges readings etc.
PERCEPTUAL-MEMORY SKILL (PER-MEM)	Capacity to evaluate acceptibility of display
DIAGNOSTIC SKILL (DIAG.)	Capacity to infer malfunctions from more than one information source
TEXTUAL RETRIEVAL (TEXT)	Ability to locate textual material using table of contens, indexes, tables, schedules, etc.
KINESTHETIC SKILL (KINES)	Ability to perform a function by feel with no visual guidance
ORGANIZATIONAL SKILL (ORGAN.)	Ability to organize work tools and unit components in an orderly manner leading to more effective utilization, reduced lost time, increased efficiency following maintainance and fault analysis procedures

ABBREVIATIONS AND SYMBOLS

A/M - Automatic/Manual

D/L - Drum Level

F/F - Feed Flow

FDB - Forced Draft Blower

I/P - Input

IAW - In Accordance with

NWL - Normal Water Level

O/P - Out Put

S/F - Steam Flow

STM - Steam

W/O - Without W/ With

XMTR -Transmitter

= - Equal To

≠ - Not Equal To

≃ - Approx. Equal

↑ - Increase or Increasing

↓ - Decrease or Decreasing

↗ - Does not Increase

↘ - Does not Decrease

< - Less Than

> - Greater Than

ΔP - Differential Pressure

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HAGAN

AUTOMATIC BOILER CONTROLS

SYSTEMS

FAULT ANALYSIS SEQUENCE

(F.A.S.)

FAULT ANALYSIS SEQUENCES - INTRODUCTION

This section contains fault analysis sequences for nine specific failure modes of the ABC Hagan. These sequences were developed from discussions with ABC maintenance personnel and training course instructors. The analyses include the sequence of tasks, the skills and knowledge associated with each task, the training objectives derived from the skills and knowledges, and other relevant comments. Each fault analysis sequence is complete in itself except for places in the sequence where a repair and calibration process is required. The descriptions of repair and calibration sequences were not available. The analysis also make frequent reference to specific subtasks which describe activities associated with reconfiguration of the console. These subtasks (1 through 5) are presented on the following pages.

S U B T A S K I N D E X

SUBTASK NO(ST)	TASKS	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1. Boiler Master A/M FDB A/M STA	Shift 4 way A/m Station from remote manual to auto 1. Parallel Indicators using Compensating Relay Control 2. Turn Transfer Valve 90° to Reset Position 3. Parallel Indicators for Final Alignment Using Compensating Relay 4. Turn Transfer Valve 90° to Auto Position	Per-mot indicators using pensating relay control in reset position and place control in automatic	Location of control and indicators	Given an operating console with 4 way A/M stations in remote manual, parallel gages and shift control from manual mode to automatic mode monitor function to ensure console has control in 15 sec without error	
2. Boiler Master FDB A/M STA	Shift 4 way A/M station from auto to remote manual 1. Parallel indicators using comp relay control 2. Turn transfer value 90° to reset position 3. Parallel indicators for final alignment using comp. relay 4. Turn transfer valve 90° to manual position and assume control in manual	Per mot parallel indicators using comp relay control in reset position and place control in remote manual	Location of control and indicators	Given an operative console with 4 way A/M stations in auto., parallel indicators and shift control from auto mode to remote manual and assume control of function in remote manual mode in 15 sec without error	

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	TASK	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
3. FDB Master A/M FO A/M Feed Water A/M	Shifting 2 way A/M Station from auto to remote manual 1. Parallel indicators using relay sender 2. Turn transfer valve 180° to manual position and assume control in remote manual	Per-mot Parallel indicators using relay sender control and place control in manual position	Location of control and indicators	Given an operating console with 2 way A/M stations in auto-parallel indicators and shift control to manual and assume control of function in remote manual	
4. FDB Master A/M FO A/M Feed Water A/M	Shifting 2 way A/M Station from remote manual to auto 1. Parallel indicators using relay sender 2. turn transfer valve 180° to auto position			Given an operating console with 2 way A/M stations in remote manual. Parallel indicators and shift control to auto monitor function to ensure console has control in 15 sec. without error	
5. Stm. Flow Feed Flow Transmitter	Placing transmitter unit in service			Given a xmtr installed with its isolation valves demonstrate correct procedure to place xmtr in service in 3 min w/no procedural error	
	1. Close sensing line valves from source	MOT	Location of valves		
	2. Open equalizing valve	MOT			
	3. Open sensing line valves from source	MOT	Location of valves		
	4. Allow sensing lines to cool until they are cool to the touch	King-feel lines to ensure no hot steam or liquid	Hot steam or hot liquid may severly damage xmtr location of valves		
	5. Open L.P. sensing line input valve at xmtr.	MOT			
	6. Vent H.P. & L.P. sides of xmtr.	Per-mot observe vent line as valve is opened to insure air is expelled			
	7. Open H.P. Sensing line valve at xmtr.				
	8. Close equalizing valve at xmtr.	MOT			

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Inability to steam in auto with a clear stack 1.3.1 Black Smoke or smoke density alarm	1	Take Control of console from operator	Organ-relieves operator on portion of control under consideration	Operational	Given an operating console with FDB am/sta in manual control of console and manipulate controls to reproduce the event symptoms within 1 min to 100% accuracy.	Only partial control is taken by maintainance man Operator continues to maintain watch on boiler during FAS and assist maint. man by manipulating controls as directed
	2	Reproduce trouble	Per mot			
	2.1	Return FDB A/M sta to Auto	[ST 1] *	[ST 1]		
	2.2	Shift FDB Master A/M sta. to Auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	2.3	Shift fo A/M Sta. to auto [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	2.4	Readjust fuel/air ratio to normal setting	Per-mot memory-adjust fuel/air ratio knob while observing gage for correct setting (excess air adj.-console)	Correct setting is 50% with overload sprayer plates installed and 56-60% with normal sprayer plates	Given an operating console with Fuel/Air Ratio at an incorrect value, identify sprayer plates installed and readjust Fuel/Air Ratio to correct setting in 30 sec w/no procedural error.	
	2.4.1	Turn excess air adjuster knob and observe gage move to normal %				
	2.5	Observe reproduced event	per	Appearance of periscope when stack is smoking black location of periscope and density meter (periscope by console density meter on console)	Given periscope indication of black smoke, verify stack condition by using smoke density meter in 30 sec 100% accurate.	Information on sprayer plates installed is obtained from top watch
	2.5.1.	Observe periscope to verify black smoke	per	Location of smoke density meter		

* ST 1 = Subtask 1

* Subtask 1

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3	Make observations on console front to determine fault checks lo-signal selector observe fuel demand and air flow signing	Diag.	System operation		
	3 1.1	Determine that fuel demand signal is = to or < air flow signal, (if fo demand sig ls . to or < air flow signal proceed to 1.3.1.3.2)	Diag.-observe fuel demand and air flow signals to determine if trouble is located upstream or down stream of the FO A/M st. (demand and airflow indic. on console)	System operation when FO signal is = to or < air flow signal, upstream oil loop is eliminated as a source of trouble	Given an operating console, elimate upstream FO loop by observing FO demand signal to be = to or < air flow signal in 5 sec. to 100% accuracy	
	3.1.2	Determine that FO signal is > airflow signal	Diag. - observe FO demand and air flow signals to determine if trouble is located up stream or down stream of FA A/M Sta. (FO A/M on console)	System operation when FO demand signal is > air flow signal trouble is in up stream oil loop and componet indicated is low signal selector (low sig. selector-under console)	From an operating console that displays AFO demand signal > the air flow signal determine that the trouble is located in the upstream oil loop and that the low signal selector is the indicated component in one minute to 100% accuracy	
	3.1.3	Correct fault in low sig. selector			Given an operating console into which a low signal selector fault has been placed isolate and remove faulty componet in 10 mins. with no procedural errors	
	3.1.3.1	Remove low signal selector from system				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.1.3.1.1	Shift FO A/M Sta.to manual [ST 3]	[ST 3]	[ST 3]		
	3.1.3.1.2	Shift FDB Master A/M Sta.to manual [ST 3]	[ST 3]	[ST 3] console is now in two knob remote manual control		
	3.1.3.1.3	Shut Supply air to excess air adjuster	MOT	Location of system isolation valves (under console)		
	3.1.3.1.4	Shift boiler master A/M Sta to Man. [ST 2]	[ST 2]	[ST 2]		
	3.1.3.1.5	Decreaae Boiler maater output signal to zero	Per-mot turn comp relay knob on boiler master sta in decrease direction while observing gage. (boiler master sta. on console)	Location of controls low signal selector input signals are now isolated		
	3.1.3.1.6	Disconnect and remove low signal selector	MOT use hand tools to disconnect and remove			In all procedures where hand tools are required tools list will be included with cal and repair insert
	3.1.3.1.7	[Inaert calib and repair] *	[ ]	[ ]	[ ]	
	3.1.3.1.8	Reinstall and reconnect low signal selector in system			Given a repair and recalibrated low signal selector reinstall in system within 10 min.	

* [ ] Brackets indicate skill, knowledge,and training objectives are still to be developed for these inventory items.

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.1.4	Evaluate results of corrective actions	Diag.-observe console indic as unit is put back in service to determine if corrective actions are sucessful	System operation	Given an operative console from which low signal selector fault has been removed determine from console front indications that unit is operating satisfactorily	
	3.1.4.1	Open air supply to excess air adjuster	MOT/MEM	Sys operation auto indicator on FO A/M station should remain at zero		
	3.1.4.2	Increase manual out put signal on boiler master A/M station to a point above air flow indication	Per-mot/MEM	Sys oper-auto indication on FO A/M sta should track with boiler master indication up to air flow indicator then stop. Even though boiler master indication continues to increase		
	3.1.4.3	Parallel boiler master indicators	Per-mot			
	3.1.4.4	Shift FO A/M sta to auto [ST 4]	[ST 4]	[ST 4]		
	3.1.4.5	Shift FDB master to A/M sta to auto [ST 4]	[ST 4]	[ST 4] console is now in the knob remote man control on boiler master A/M station		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.1.4.6	Observe System responae in that stacks are clear and there is no smoke density alarm	Per MEM observe console parameters and periscope/smoke density meter for sat. oper.	Sys. operation	Given an operating onsole with fsult corrected determine from console front indications, periscope, and smoke density meter that system now has ability to stesm with clear stack	
	3.1.4.7	Return control of console to operstor				
	3.2	Observe blower speeds				
	3.2.1	Observe blower speeds sre compatible with plant demand proceed to 1.3.1.3.3	Diag. observe blower tachometers and compare with plant demand to determine acceptibility (tachs on console)	When blower speeds are compatible with plant demand upstream air loop is eliminated as a source of trouble		There is some variation in valves for plant demand vs. blower speed on different plants.
	3.2.2	Observe blower speeds are not compstible with plant demand	Diag. observe blower tachometers and compare with plant demand to determine acceptibility (tach on console)	When blower speed are not compatible with plant demand indicates trouble is located in upstream air loop	Given an operating console with a display indicating plant demsnd not compatable with blower speeds identify upstream air loop as the source of trouble in 10 sec. to 100% accuracy	
	3.2.2.1	Shift Boiler master A/M sta to manual [ST 2]	[ST 2]	[ST 2]	[ST 2]	
	3.2.2.2	Shift FO A/M sta to manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.2.2.3	Shift EDB Master A/M Sta to manual [ST 3]	[ST 3]	[ST 3] Console is now in two knob remote manual control	[ST 3]	
	3.2.2.4	Adjust excess air adjuster to 50%	Per mot-adj. observe gage	Location		
	3.2.2.5	Observe excess air adjuster and air flow xmtr. outputs	Per-	Location (A/F xmtr. O/P) (Excess air adj. O/D under console)		
	3. .2.5.1	Determine that excess air adjuster output is = to air flow xmtr. output proceed to 1.3.1.3.2.5	Diag. observe excess air adjuster and air flow xmtr output to determine if they are equal	When excess air adjuster output = to air flow xmtr output indicates trouble is in air flow xmtr.	Given an operating console with a display indicating excess air adjuster = to air flow xmtr. output identifys that the source of trouble is in the air flow xmtr. in 10 sec to 100% accuracy	
	3.2.2.5.2	Determine that excess air adjuster ≠ air flow xmtr output	Diag.-observe excess air adjuster and air flow xmtr outputs to determine if they are ≠	When excess air adjuster and air flow xmtr. outputs are ≠ indicates that trouble is in excess air adjuster	Given an operating console with a display indicating excess air adjuster ≠ to air flow xmtr. output identifies that trouble is located in excess air adjuster	
	3.2.3	Correct fault in excess air adjust.		(Excess air adjuster under console)	Given an operating console into which an excess air adj. fault has been placed. Isolate and remove faulty component in 10 mins. with no procedural errors	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.2.3.1	Shut air supply to air flow xmtr. and excess air adjuster		Location (A/F xmtr-space exc. air adj. under console)		
	3.2.3.2	Disconnect and remove excess air adjuster	Not-use hand tools to disconnect and remove	Location of excess air adjuster under console		
	3.2.3.3	Insert calibration and repair				
	3.2.3.4	Reinstall and re-connect excess air adjuster			Given a repaired and recalibrated excess air adjuster reinstall in system in 10 min. with no procedural errors.	
	3.2.4	Evaluate results of corrective actions	Diag. - observe console indications as unit is put back in service to determine if corrections are successful	Sys operation	Given an operating console from which excess air adjuster fault has been removed, determine from console front indications that unit is operating sat.	
	3.2.4.1	Open supply air to air flow xmtr. and excess air adjuster		Sys. oper. excess air adjuster output should now be = to air flow xmtr. output		
	3.2.4.2	Parallel indicators on boiler master A/M stat.				
	3.2.4.2	Shift FO A/M sta to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	3.2.4.3	Shift FDB A/M sta to auto [ST 4]	[ST 4]	[ST 4]		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.2.4.4	Observe system response in that stack is clear while manipulating system in one knob control	Per MEM - observe console parameters and periscope/smoke density meter for sat. operation	Sys. operation	Given the operating console with excess air adjuster fault corrected determine from console front indications, periscope and smoke density meter that system now has ability to steam with clear stack in 3 min.	
	3.2.4.4.1	Shift boiler master A/M sta. to auto [ST 1]	[ST 1]	[ST 1]		
	3.2.4.4.2	Return control of console to operator				
	3.2.4.5	Observe that periscope is not clear	Per-observe periscope and verify with smoke density meter	Appearance of periscope when stack is smoking		
	3.2.5	Correct fault in air flow xmtr.		(A/F xmtr. in space)	Given an operating console into which an air flow xmtr. fault has been placed isolate faulty component within 3 mins. with no procedural errors	This T/O is split because in some cases the air flow xmtr may be repaired in place using a portable test unit. The insert will make provision for both portable and fixed test units.
	3.2.5.1	Shut air supply and sensing lines to air flow transmitter	Mot	Location		
	3.2.5.2	Disconnect and remove air flow xmtr.	Mot-use hand tools to disconnect and remove	Location of air flow xmtr. under console	Given an operating console in which an air flow xmtr. fault has been isolated, remove air flow xmtr. from system in 5 mins. with no procedural errors.	
	3.2.5.3	[Insert Cal and Rep.]	[ ]	[ ]	[ ]	

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EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.2.5.4	Reinstall and reconnect air flow xmtr.	Mot use hand tools to reinstall and reconnect		Given a repaired and recalibrated air flow xmtr. reinstall and reconnect in system in 5 min. with no procedural errors	
	3.2.5.5	Open air supply and sensing lines to air flow xmtr.	Mot	Location		
	3.2.5.6	Parallel boiler master A/M sta. indicators	Per mot			
	3.2.5.7	Shift FO A/M to auto [ST 4]	[ST 4]	[ST 4]		
	3.2.5.7	Shift FDB A/M sta to auto [ST 4] Stack not clear procede to 1.3.1.3.3	[ST 4]	[ST 4] Console is now in one knob remote man. control on boiler master A/M sta.	Given an operating console with air flow xmtr. fault removed determine from console front indications, periscope and smoke density meter that system now has ability to steam with clear stack in 3 min.	
	3.2.5.8	Shift boiler master A/M sta.to auto [ST 1]	[ST 1]	[ST 1]		
	3.2.5.9	Return control to operator				
	3.3	Observe steam atomization press.				
	3.3.1	Observe steam atomization press. to be at desired value. Proceed to 1.3.1.3.9	Diag.-MEM observe stimulation press. to determine acceptibilty of gage reading when compared to oil press. (Steam & oil gages on console)	Steam pressure is 2 psi below oil pressure up to a max. of 80 psi stm. press. steam atom control sys. is eliminated as a source of trouble	Given plant indication of incorrect steam atomization press. in relation to oil press. determines that steam atom. control system is operating properly within 1 min.	

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EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3 : Black Smoke	3.3.2	Observe steam atomization pressure is not desired value	Diag. MEM observe stim. atom. press. to determine acceptibility of gage reading when compared to oil press (Steam and oil gages on console)	Stm. press. is not 2 psi below oil press indicates stm. atom. control system is source of trouble	Given plant indication of incorrect stm. atom. press. in relation to oil press. determines that stm. atom. control sys. is not operating properly within 1 min.	
	3.4	Localize fault in stm. atom. control system			Given plant indications of faulty stm. atom. control sys. localizes fault within 3 min.	
	3.4.1	Shift boiler master A/M sta. to man. [ST 2]	[ST 2]	[ST 2]		
	3.4.2	Vary output from boiler master A/M sta. to cause FO press. to decrease below 82 psi	Per-mot turn comp relay on boiler master A/M sta. in decrease direction until press. drops below 82 psi	Location of Control		
	3.4.3	Observe response of differential pressure pilot controller (DPPC) out to changes in FO press.	Diag. MEM observe DPPC output compared to FO press. to determine acceptibility (Gage at DPPC in space)			
	3.4.3.1	Output of DPPC responds rapidly to changes in FO pressure proceed to 1.3.3.3.5	Diag. MEM observe DPPC output compared to FO press. to determine acceptibility	Rapid response of DFPC to changes in FO press. indicates trouble located down stream of DPPC and that volume booster is next componet downstream	Given an operating console that displays rapid response at DPPC to changes in FO press. determines that trouble is located down stream of DPPC in 1 min.	

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.4.3.2	Output of DPPC does not respond rapidly to changes in FO press.	Diag. MEM observe DPPC output compared to oil press. to determine acceptibility	Lack of response of DPPC indicates trouble located in DPPC	Given an operating console that displays no or little response from DPPC determines that trouble is located in DPPC in 1 min	
	3.4.4	Correct fault in DPPC				
	3.4.4.1	Shift control of stm. atom. control valve to local. manual	Mot-use stm. atom. control value hand wheel to shift control to local man.	Location of stm. atom. control valve (in space)	Given an operating console in which a DPPC fault has been placed isolate and remove faulty DPPC within 5 min. with no procedural errors.	
	3.4.4.2	Shut supply air to DPPC	Mot	Location (at DPPC)		
	3.4.4.3	Shut inlet & outlet valves to DPPC	Mot	Location (at DPPC)		
	3.4.4.4	Disconnect & remove DPPC	Mot-use hand tools to disconnect & remove	Location of DPPC in space		
	3.4.4.5	[Insert cal. & repair]	[ ]	[ ]	[ ]	
	3.4.4.6	Reinstall & reconnect	Mot-use hand tools to reinstall & reconnect		Given a repaired & recalibrated DPPC. reinstall and reconnect in sys. in 5 min. with no procedural errors.	
	3.4.4.7	Open supply air to DPPC				
	3.4.4.8	Open inlet & outlet valves to DPPC	Mot	Location	Given a reinstalled & reconnected DPPC, deisolated & return to service in 3 min.	
	3.4.4.9	Shift control of stm. atom. control valve to auto	Mot	Location		

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.4.4.10	Observe stm. atom. control sys. to maintain correct stm. pressure while manipulating system in one knob control	Diag.-Mot observe oil press. and stm. atom. press. while operating sys. in one knob control	Stm. atom. control sys. press. at 2 psi below oil press. up to a max of 82 psi oil press.	Given an operating console with DPPC fault removed determine from console front indicatons and stm. atom. press. that stm. atom. control system is operating properly	
	3.4.4.11	Shift boiler master A/M sta. to auto. [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	3.4.4.12	Return control to operator				
	3.5	Observe Volume booster output		(At volume booster in space)		
	3.5.1	Output of volume booster = to output of DPPC proceed to 1.3.1.3.7	Diag. observe outputs of volume booster and DPPC to be =	When volume booster and DPPC output are = volume booster is eliminated as a source of trouble and stm. asst. valve is not componet	Given a display on an operating console on which volume booster and DPPC outputs are = determine that volumes are booster is not the source of trouble 1 min.	
	3.5.2	Out of volume booster ≠ to output of DPPC	Diag. observe outputs of volume booster and DPPC to be ≠	When volume booster and DPPC outputs are ≠ source of trouble is in volume booster	Given a display on an operating console on which volume booster and DPPC outputs are ≠ determines that volume booster is the source of trouble in 1 min.	
	3.6	Corrects fault in volume booster				
	3.6.1	Shift control of stm. atom. control valve to local man.	Mot-shift control of stm. atom control valve to location using hand wheel	Location of stm. atom. control valve	Given an operating console in which a volume booster fault has been placed. isolate and remove volume booster in 5 min with no procedural errors.	

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.6.2	Shift supply air to volume booster and DPPC	Mot	Location (At volume booster-in space)		
	3.6.3	Disconnect and remove volume booster	Mot use hand tools to disconnect and remove volume booster			
	3.6.4	[Insert Cal & repair volume booster]	[ ]	[ ]	[ ]	
	3.6.5	Reinstall & reconnect volume booster	Mot use hand tools to reinstall & reconnect in system	Location	Given an repaired recalibrated volume booster reinstall and reconnects in system in 5 min. with no procedural errors.	
	3.6.6	Open supply air to volume booster & DPPC		Location	Given a reinstalled and reconnected volume booster, deisolate and return to service in 3 min.	
	3.6.7	Shift control of stm. atom. control valve to auto.	Mot using hand wheel to set control in auto.			
	3.6.8	Observe volume booster output to be = to DPPC output while manipulating system in one knob control on boiler master	Per mot-MEM	Volume booster putput must be = to DPPC output	Given operating console with volume booster fault removed determine from console front indications that volume booster is operating properly and sys. can steam with clesr stsck in 3 min.	
	3.6.9	Return control to operator				
	3.7	Observe operation of stm. atom. control valve	(Valve located in space)	That movement of valve is linear with input signal ie 3psi = closed 9 psi - 50% movement 15 psi = open fully		

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.7.1	Produce variations in volume booster output	Per mot			
	3.7.2	Observe st. atom control valve closed with a 3 psi signal and open with a 15 psi signal from volume booster proceede to 1.3.1.3.9	Per mot varies volume booster signal while observing stm. atom. control valve	Lack of valve response to signal trouble is located in valve	Given an operating console and an operating stm. atom. control valve determine that valve moves correctly in response to output signal from volume booster	
	3.7.3	Observe stm. atom. control valve does not open or close in response to signal	Per mot varies volume booster signal while observing stm. atom. control valve	Lack of valve response to signal trouble is located in valve	Given an operating console and an operating stm. atom. control valve in which a stm. atom. control valve fault has been placed determine from volume booster output an control valve movement that stm atom. control valve is not operating properly an trouble is located in control 1 min.	
	3.8	Corrects fault in stm. atom. control valve			Given an operating stm. atom. control valve in which a fault has been placed isolate stm. atom cont. valve in 3 min.	
	3.8.1	Shift control of stm. atom. control valve to local manual	Mot using hand wheel to set control in local manual	Location		
	3.8.2	Shut air supply valve to volume booster	Mot	Location (at stm. atom.) (Control valve space)		
	3.8.3	[Insert cal & repair]	[ ]	[ ]	[ ]	
	3.8.4	Open air supply valve to volume booster	Mot	Location	Given a repaired stm. atom control valve deisolate and return to service in 3 min.	

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.8.5	Shift control of stm. atom. control valve to auto.	Mot-use hand wheel to take stm atom. control valve out of location man. and return to auto.			
	3.8.6	Observe that stm. atom. control valve moves in response to volume booster output when system is manipulated in one knob control			Given an operating console and an operating stm. atom. control system determine that system now has ability to steam with stack clear	
	3.8.8	Shift boiler master A/M sta. to auto. [ST 1]	[ST 1]	[ST 1]		
	3.8.9	Return control to operator				
	3.9	Observe characterizing relay output		(Gage under console)		
	3.9.1	Observe characterizing relay output to correspond with input with calibration data table proceed to 1.3.1.3.10	Diag./text ret.-extracts input vs. output dsta from calibration data tsble and compares input-output for acceptibility	Location of data table in navy ships tech. manual: that trouble is located downstream of char. relay (F/O A/M on console & relay O/P under console)	Given a display indicating correct characterizing relay input & output utilizes tech. manual information to compare input with output to determine acceptibility of indications within 5 min 100% accurate	
	3.9.2	Observe characterizing relay output does not correspond to input as per data table	Diag./text-ret. extracts input vs. output data from calibration data table and compares input-output for acceptibility	Location data table: that trouble is located in char. relay (char. relay mounted under console)	Given a display indicating incorrect char. relay output, utilizes tech. manual information to determine indications are not acceptable and that characterizing relay is the trouble source within 5 min 100% accurate	

EVENT		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.9.2.1	Correct fault in char. relay				
	3.9.2.2	Shift control of FO flow control valve to local manual using hand jack	Per mot use hand jack on FO flow cont. valve to take control and observe FO press gage to determine when control in local manual is effected	Location of FO flow cont. valve hand jack and local FO press. gage to (valve in space, gage on gage board in space)	Given an operating FO flow control valve and indication of normal system FO pressure assume control of FO pressure in local min. in 3 min. with no procedural errors	
	3.9.2.3	Shut air supply valve to char. relay	Mot	Location (under console)	Given an operating console into which a char. relay fault has been placed isolate & remove chair relay in 5 min. with no procedural errors	
	3.9.2.4	Disconnect & remove char. relay	Mot use hand tools to disconnect & remove	Location of char. relay under console		
	3.9.2.5	[Insert cal & repair]	[ ]	[ ]	[ ]	
	3.9.2.6	Reinstall & reconnect char. relay			Given an operating console and a repaired & recalibrated char. relay reinstall & reconnect in system in 5 min. with no procedural errors	
	3.9.2.7	Open supply air valve to char. relay	Mot	Location	Given a reinstalled & reconnected char. relay deisolate and return to service in 3 min.	
	3.9.2.8	Shift control of FO flow control valve to remote manual	Per mot use hand jack on FO flow control valve to return control to remote manual observe FO press gage to determine when remote manual control is effected	Location FO flow cont. val. & local FO press. gage.	Given an operating FO flow control valve and indications of normal FO system press effect remote manual control in 3 min. with no procedural errors.	

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.9.2.9	Shift FO A/M sta. to auto [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	3.9.2.10	Observe that char. relay output now corresponds to input in accordance with data table stack not clear proceed to 1.3.1.3.10	[⟶]	[⟶]	As 1.3.1.3.9.1	
	3.9.2.11	Return control to operator				
	3.10	Observe FO flow control valve		(Valve located in space)		
	3.10.1	Observe that FO pressure varies smoothly as FO A/M station output is varies Stack not clear proceed to 1.3.1.3.10.2.3.2	Per mot vary FO A/M sta. output while observing FO press. gage for acceptibility	Location FO press. gage that smooth movement of FO press gage indicates FO flow control valve operating properly (gage on console)	Given an operating console with indication of FO pressure moving smoothly and response to FO A/M sta. output determines that FO flow control valve is not the source of trouble	
	3.10.2	Observe that FO pressure does not vary smoothly as FO A/M sta. output is varied	Per mot vary FO A/m sta. output while observing FO press. gage for acceptibility	Location FO press. gage that eratic movement of FO press. gage indicates FO flow control valve not operating properly	Given an operating console with indications of eratic FO press in response to varying FO A/M sta output determines that trouble is located in FO flow control valve	
	3.10.2.1	Shift control of FO flow cont. valve to local manual	[⟶]	[⟶]	1.3.1.3.9.2.1	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.10.2.2	Crack open FO flow control valve bypass		(By-pass located near F/O control valve-in space)		
	3.10.2.3	Shut FO inlet valve to FO flow cont. valve while opening by-pass to assume control of FO press on by-pass	Mot-close one valve while opening another to maintain a smooth transition of control	(Isolation valves located near F/O control valve in-space)	Given an operating system shift control of FO pressure to the by-pass and isolate FO flow control valve	
	3.10.2.4	Shut F.O. outlet valve				
	3.10.2.5	Disconnect & remove FO flow control valve	Mot use hand tools to disconnet & remove			
	3.10.2.6	[Insert repair]	[ ]	[ ]	[ ]	
	3.10.2.7	Reinstall & reconnect FO flow control valve	Mot			
	3.10.2.8	Open FO flow cont. valve outlet valve				
	3.10.2.9	Crack open inlet valve				
	3.10.2.10	Shut by-pass valve while opening inlet valve to assume control of FO pressure on FO flow control valve in local manual	[1.3.1.3.1.0.2.3]			
	3.10.2.11	Shift control of FO flow control valve to remote man.	Mot use hand jack to assume control in remote manual			

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1 Black Smoke	3.10.2.12	[Inscrt Cal for min. oil Press.]	[ ]	[ ]	[ ]	
	3.10.2.13	Shift FO A/M Sta to auto[ST 1] and observe stacks clear	[ST 1]	[ST 1]	[ST 1]	
	3.10.2.14	Return control to operator				
Concludes black smoke event						

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Inability to Steam in Auto with a Clesr Stack						
1.3.2. White smoke or smoke density alarm	1	Take control of console from operator	Org.-relieves operator on portion of controls under considerstion			
	1.1	Reproduces event	Per mot	Symptoms as relsted by operator	Given an operating console on which operator corrective action has been taken reproduce event within 1 min.	
	1.1.1	Shift FDB A/M sta. to auto [ST 1]	[ST 1]	[ST 1]		
	1.1.2	Shift FDB master A/M sta. to auto [ST 4]	[ST 4]	[ST 4]		
	1.1.3	Shift FO A/M sta. to suto [ST 1]	[ST 1]	[ST 1]		
	1.1.4	Readjust fuel/air ratio to normal setting by turning excess air adjuster knob and observe gage move to normal % for installed plates	Per mot MEM manipulate fuel/air ratio knob while observing gage for correct setting for sprayer plates instslled	Sprayer plstes vs % FG/AM ratio - normal setting is 50% with overload sprayer plates and 56-60% with normal sprayer plstes	Relationship of sprayer plate size to air volume required to stesm with clear stsck condition	
	1.2	Observe reproduced event				
	1.2.1	Observe periscope & smoke density meter to verify white smoke	Per,	Location of periscope & smoke density meter (periscope on console meter on console		

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2	Make observstions on console	Diag.	Sys. Operation		
	2.1	Observe characterizing relay output				
		[This procedure identical to 1.3.1.3.9 in Black Smoke Event]				
	2.1.2.9	Return control to operator				
	2.2	Observe FO flow control valve operation				
		[This procedure identical to 1.3.1.3.10 in Black Smoke Event]				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.2.2.1.3	Shift FO A/M sta to auto [ST 1] stack not clear proceed to 1.3.2.2.3	Per observe periscope	Indicates trouble located in air loop		
	2.2.2.1.4	Return control to operator				
	2.3	Observe FDB A/M station				
	2.3.1	FDB A/M station output = to input when in auto.	Diag. - compare output with input (indicators on console)	Sys. oper. indicates that A/M stations are operating properly	Given a FDB A/M station display indicating output = to input determines that A/M station is operating properly in 5 sec.	
	2.3.2	FDB A/M station output ≠ to input when in auto			Given a FDB A/M station display indicating output ≠ to input determinea that A/M station is not operating properly in 5 sec.	
	2.4	Correct fault in FDB A/M station				
	2.4.1	Shift FDB A/M stations to remote manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	2.4.2	Shift control of blower associated with faulty FDB A/M station to local manual	Per mot	Location of local man. control of blower	Given an operating blower control, shift control from remote manual to local manual in 3 min. W/O precedural error	
	2.4.3	Shut air supply to faulty FDB A/M sta.		(Valve under console)	Given an operating console with indications of faulty A/M station, isolate & remove the compensating relay in 5 min. with no procedural errors	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.4.4	Disconnect & remove compensating relay	Mot-use hand tools to disconnect & remove comp. relay	Location of comp. relay in A/M sta under console	Given an operating console with indications of faulty A/M station, isolate & remove the compensating relay in 5 min. with no procedural error	
	2.4.5	[Insert Rep. & Calib.]	[ ]	[ ]	[ ]	
	2.4.6	Reinstall & reconnect comp. relay	Mot use hand tools to reinstall & reconn.	Location	Given a repaired & recalibrated compensating relay, reinstall & reconnect in A/M station & deisolate in 5 min. W/O procedural error	
	2.4.6	Shift control of affected blower to remote manual			Given an operating blower counted, shift control from local manual to remote manual in 3 min. W/O procedural error	
	2.4.7	Shift FDB A/M sta. to auto [ST 1] Stack not clear proceed to 1.3.2.2.5	[ST 1]	[ST 1]	[ST 1]	
	2.4.8	Return control to operator				
	2.5	Observe downstream air loop	Per			
	2.5.1	Vary FDBA/MSTA O/P and observe that blowers respond throughout range	Per Mot - Vary A/M Sta O/P while observing blower tachs. (Tachs on console)	Smooth response of blowers indicate down stream air loop functioning properly and not source of trouble	Given a display indicating blower response, determines that fault is not in down stream air loop in 1 min.	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.5.2	Vary FDB A/M sta. output and observe that blowers do not respond smoothly throughout range	Per mot vary A/M sta. output while observing blower tachs.	Eratic response of blowers indicates trouble is located in downstream air loop (range mod- under console)	Given a display indicating eratic blower response determines that fault is located in downstream air loop in 1 min.	
	2.6	Check range modifier				
	2.6.1	Check that range modifier O/P corresponds to FDB A/M sta. O/P according to Calib. table data proceed to 1.3.2.2.6	Per/text compare O/P's from range modifier & FDB A/M sta. with data taken from calib. table	Location of indications location of calib. data (gages under console)(data in tech. manual)	Given a display indicating range modifier O/P and FDB A/M sta O/P correspond and a calib. table, determine by comparison that range modifier is not the source of trouble and that FDB governor & emission valve is the only unit left in down stream loop	
	2.6.2	Check that range modifier O/P does not correspond to FDB A/M O/P according to calib. data table	Per/text compare O/P's from range modifier & FDB A/M sta. with data taken from calib. table	Location of indications location of calib. data (gages under console) (data in tech. manual)	Given a display indicating range modifier O/P and FDB A/M sta. O/P do not correspond, and a calib-table. Determine by comparison that range modifier is source of trouble in 1 min.	
	2.7	Correct fault in range modifier			Given an operating console in which a range modifier fault has been placed isolate & remove range modifier in 5 min. w/o procedure error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE
1.3.2 White Smoke	2.7.1	Shift FDB A/M sta. to remote manual [ST 2]	[ST 2]	[ST 2]	
	2.7.2	Shift control of affected FDB to local manual	[1.3.2.2.4.2]	[1.3.2.2.4.2]	[1.3.2.2.4.2]
	2.7.3	Set affected FDB A/M sta. manual O/P to "O" psi	Per mot adjust char relay while observing indentation.		
	2.7.4	Shut supply air to range modifier	Mot	Location (under console)	
	2.7.5	Disconnect & remove range modifier	Mot-use hand tools to diaconnect & remove	Location (Under console)	
	2.7.6	[Insert Rep & calib.]	[ ]	[ ]	[ ]
	2.7.7	Reinstall & reconnect range modifier	Mot-use hand tools		Given a repaired and recalibrated range modifier, reinstall & reconnect in system and deisolate in 5 min. W/O procedural error
	2.7.8	Open supply air to range modifier	Mot	Location	
	2.7.9	Shift control of affected FDB from local manual to remote manual	Per mot		
	2.7.1 0	Shift FDB A/M sta. to auto [ST 1]	[ST 1]	[ST 1]	[ST 1]
	2.7.1 1	Shift FDB master A/M sta. to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 Cont. White Smoke	2.7.1 2	Observe that range modifier O/P now corresponds to FDB A/M sta. O/P Iaw calib. data table stack not clear proceed to 1.3.2.2.6	Per text ref. compare range mod. & A/M sta. O/P with data table	Location-indicates location data table use of data table	Given a display indicating range modifier O/P and FDB A/M sta. O/P corresponds Iaw calib. table determine by comparison that range modifier fault has been correct within 3 min. to 100 % accuracy	
	2.7.1 3	Return control to oper.				
	2.8	Check FDB governor & stm. emission valve	Per mot	Location on FDB unit FDBRM	Given a FDB governor & stm. emission valve isolate & inspect governor and emission valves for possible defects in min. to % accuracy	A positive check for this problem has not been developed
	2.8.1	Shift affected FDB A/M sta to remote manual [ST 2]	Per mot [ST 2]	[ST 2]		
	2.8.2	Secure affected FDB				This step in the procedure is accomplished by watch stander
	2.8.3	Shut supply air to affected range modifier		(Under console at FDB)		
	2.8.4	Shut root stm. & exhaust valves to FDB				
	2.8.5	[Insert calib. & repair]	[ ]	[ ]	[ ]	[ ]
	2.8.6	Open supply air to range modifier				
	2.8.7	Open root stm. & exhaust valves to FDB				

EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.8	Start FDB (FDB A/M sta. in remote man.)				Watch stander starts FDB
	2.8	[Insert final calib.]	[ ]	[ ]	[ ]	
	2.8 9	Observe that FDB now responds smoothly to varing FDB A/M sta. O/P			Given a FDB in which governor and emission valve fsults have been removed. Determine from observations that FDB now respond smoothly to varing FDB A/M sta. O/P	
	2.8.10	Shift FDB A/M sta. to Auto	[ST 1]	[ST 1]		
	2.8.11	Shift FDB Master A/M sta. to Auto. Stack not clear proceed to 1.3.2.2.7 [ST 4]	[ST 4]	[ST 4]		
	2.8.12	Return control to operator				
	2.9	Check upstraam air loop				
	2.9.1	Observe that FDB Master A/M auto input decreases to "0" psi when excess air adjuster output is increased above indicated boiler demand. Proceed to 1.3.2.2.11	Per mot observe O/P indications while increasing excess air adjuster O/P	Indicates that air flow controller & air flow rate relay are operating properly (A/F cont relay under console.	Given sn operating console thst displsy a "0" psi indication on the FDB Master A/M Auto indicator when excess air adjuster output is increased above boiler demsnd. determine from the display that air flow controller & air flow rate raly are functioning properly in 1 min.	
	2.9.2	Observe that FDB master A/M auto. I/P does not decrease to "0" psi when excesc air adjuster O/P is increased above indicated boiler demand	Per mot observe O/P indications while increasing excess air adjuster O/P	Indicates that trouble is located in air flow controller or air flow rate relay	Given an operating console thst displays FDB master A/M suto O/P thst does not decresse to "0" psi when excess air adjuster O/P is increased above boiler demand determine from the display that the sir flow controller or air flow rste relay in 1 min. is source of troubles	

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EVENTS		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.9	Check air flow rate relay				
	2.9.3.1	Observing that air flow rate relay O/P is = I/P from air flow controller	Diag. compare air flow rate relay O/P with I/P from air flow controller (Gages under console)	That plant must be at steady state in order to get air flow rate relay O/P = to I/P from air flow controler to eliminate air flow rate relay as a source of trouble	Given a display indicating air flow rate relay O/P = to I/P from air flow controller determine from display that air flow rate relay is operating properly in 1 min. 100 %	
	2.9.3.2	Observe that air flow rate relay O/P ≠ to I/P from air flow controller	Diag. compare air flow rate relay O/P with I/P from air flow controller (gages under console)	That plant must be at steady state in order to get air flow rate relay O/P = to I/P from air flow controller to eliminate air flow rate relay as a source of trouble	Given a display indicating air flow rate relay O/P ≠ to I/P from air flow controller determine from display that air air flow rate relay is source of trouble in 1 min. 100 %	
	2 9	Correct fault in air flow rate relay	Per mot	Location in system (under console)		
	2.9.1	Shift FO A/M sta. to remote manual [ST 3]	[ST 3]	[ST 3]		
	2.9.2	Shift FDB master A/M sta. to remote manual [ST 3]	[ST 3]	[ST 3] Console is now in two knob man. control location of valves (under console)		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 Cont. White Smoke	2.9.3	Shut air supply valves to excess air adjuster, air flow controller and air flow rate	Mot	Location of valves (under console)		
	2.9.4	Disconnect & remove air flow rate relay				
	2.9.5	[Insert Reapir & calib]	[ ]	[ ]	[ ]	
	2.9.6	Reinstall & reconnect air flow rate relay in system			Given a repaired & recalibrated air flow rate relay, reinstall and reconnect in system and deisolate in 5 min. w/o procedural error	
	2.9.6	Open supply air valves to excess air adjuster air flow controller & air flow rate relay	Mot	Location of valves		
	2.9.7	Shift FO A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]		
	2.9.8	Shift FDB master A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]		
	2.9.9	Observe that air flow rate relay O/P is now = to I/P from air flow controller, stack not clear proceede to 1.3.2.2.9	Diag.-compare air flow rate relay O/P with air flow controller I/P	[1.3.2.2.7.2.1]	[1.3.2.2.7.2.1]	
	2.9.1 0	Return control to operator				
	2.10	Check air flow controller				
	2.10.11	Observe that air flow controller O/P↓ to "0" psi when indicated air				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke		flow is ↑ above boiler demand. Stack not clear proceed to 1.3.2.2.1.1	Diag-per mot compare air flow controller O/P with indicator air flow	Sys Oper (A/F cont. O/P under console Indic A/C on console)	Given an operating console that displays a "O" psi when air flow is ↑ above boiler demand determine from display that air flow controller is not the source of trouble. 1 min. 100%	
	2.10.2	Observe that air flow controller O/P ↓ to "O" psi when indicated air flow is ↑ above boiler demand	Diag		Given an operating console that display a value other than "O" psi when air flow is ↑ above boiler demand, determine from display that air flow controller is the source of trouble in 1 min. 100%	
	2.11	Corrects fault in air flow controller	Per-mot	Location in system	Given an operating console in which an air flow controller fault has been placed isolate and remove air flow controller from system in 5 min. W/O procedural error.	
	2.11.1	Shift boiler master A/M to remote manual [ST 2]	[ST 2]	[ST 2]		
	2.11.2	Shift FOB master A/M to remote manual [ST 3]	[ST 3]	[ST 3]		
	2.11.3	Shift FO A/M sta to remote manual [ST 3]	[ST 3]	[ST 3] console is now in two knob control		
	2.11.4	Shut supply air to excess air adjuster & air flow controller	Mot	Location of valves (under console)		
	2.11.5	Set boiler master A/M at "O" psi	Per-mot ↓ compensating relay while observing O/P indication.	Sys oper. "O" psi on boiler master A/M insulates air signal to air flow controller		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 cont. White Smoke	2.11.6	Disconnect & remove air flow controller	Mot use hand tools to disconnect & remove	Location (under console)		
	2.11.7	[Inset Cal & repair]	[ ]	[ ]	[ ]	
	2.11.8	Reinstall & reconnect air flow controller	Mot		Given a repaired & recalibrated air flow controller, reinstall reconnect in system & deisolate in 5 min. w/o procedural error	
	2.11.9	Oper. supply air to air flow controller & excess air adjuster				
	2.11.10	Shift F A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]		
	2.11.11	Shift FDB master A/m to auto. [ST 4]	[ST 4]	[ST 4]		
	2.11.12	Shift boiler master A/M to auto. [ST 1]	[ST 1]	[ST 1]		
	2.11.13	Observe that air flow controller O/P now ↓ to "0" psi when indicated air flow is ↑ above boiler demand stack not clear proceed to 1.3.2.2.1.1	1.3.2.2.9.1	Sys. oper.	1.3.2.2.9.1	
	2.11.14	Return control to operator				
	2.12	Check excess air adjuster				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.12.1	Shift Boiler Master A/M sta. to manual [ST 2]	[ST 2]	[ST 2]	[ST 2]	
	2.12.2	Shift FD A/M sta. to manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	2.12.3	Shift FDB Master A/M sta. to manual [ST 3]	[ST 3]	[ST 3 Console in now in two knob remote manual control	[ST 3]	
	2.12.4	Adjust excess air adjuster to 50%	Per mot-adj. observe gage	Location		
	2.12.5	Observe excess air adjuster and air flow xmtr. outputs	Per	Location (A/F xmtr. O/P) (Excess air adj. O/P under console)		
	2.12.5.1	Determines that excess air adjuster output is = to air flow xmtr. output proceed to 1.3.2.2.1.2	Diag. observes excess air adjuster and air flow xmtr. output to determine if they are equal	When excess air adjuster output = to air flow xmtr. output indicates trouble is in air flow xmtr.	Given an operating console with a display indicating excess air adjuster = to air flow xmtr. output identifys that the source of trouble is in the air flow xmtr. in 10 sec. to 100% accuracy	
	2.12.5.2	Determines that excess air adjuster ≠ air flow xmtr. output	Diag. - observes excess air adjuster and air flow xmtr. outputs to determine if they are ≠	When excess air adjuster and air flow xmtr. outputs are ≠ indicates that trouble is in excess air adjuster	Given an operating console with a display indicating excess aid adjuster ≠ to air flow xmtr. output identifies that Trouble is located in excess air adjuster	
	2.12.6	Corrects fault in excess air adjust		(Excess air adjuster under console)	Given an operating console into which an excess air adj. fault has been placed. Isolate and remove faulty component in 10 mins. with no procedural errors	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.12.6.1	Shut air supply to air flow xmtr. and excess air adjuster		Location (A/F xmtr.-space exc. air adj. under consaole)		
	2.12.6.2	Disconnect and remove excess air adjuater	Not-use hand tools to disconnect and remove	Location of excess air adjuster under console		
	2.12.6.3	Insert Calibration and repair				
	2.12.6.4	Reinstall and reconnects excess air adjuster			Given a repaired and recalibrated exceas air adjuster reinstall in system in 10 min. with no procedural errors.	
	2.12.7	Evaluate resulta of corrective actions	Diag. - obaerve console indicationa as unit is put back in service to determine if correctiona are successful	Sya operation	Given an operating consaole from which excesa air adjuster fault has been removed, determine from consaole front indicationa that unit is operating sat.	
	2.12.7.1	Open supply air to air flow xmtr. and excesa air adjuster		Sya. oper. exceas air adjuater output ahould now be = to air flow xmtr. output		
	2.12.7.2	Parallel indicators on boiler master A/M stat.				
	2.12.7.2	Shift FO A/M sta. to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	2.12.7.3	Shift FDB A/M ata. to auto [ST 4]	[ST 4]	[ST 4]	Consaole is now one kind remote man. control on boiler master A/M sta.	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.12.7.4	Observe system response in that stack is clear while manipulating system in one knob control	Per MEM - observe console parameters and periscope /smoke density meter for sat. operation	Sys. operation	Given the operating console with excess air adjuster fault corrected determine from console front indications, periscope and smoke denaity meter that system now has ability to steam with clesr stack in 3 min	
	2.12.7.4.1	Shift Boiler master A/M sta. to auto [ST 1]	[ST 1]	[ST 1]		
	2.12.7.4.2	Return control of console to operator				
	2.12.7.5	Observe that periscope is not clear	Per-observe periscope and verify with smoke density meter	Appearance of periscope when stack is smoking		
	2.13	Correct fault in air flow xmtr.		(A/F xmtr. in space)	Given an operating consola into which an air flow xmtr. fault has been place isolate faulty component within 3 mins. with no procedural errors	This T/O is split because in some cases tha air flow xmtr. may ba rapairad in placa using a portabla test unit. The insart will make provision for bcth portable and fixed test units
	2.13.1	Shut air supply and sensing lines to air flow transmitter	Mot	Location (At xmtr.-space)		
	2.13.2	Disconnect and remove air flow xmtr.	Mot-use hand tools to disconnect and remove	Location of air flow xmtr. under console	Given an operating console in which an air flow xmtr. fault has been isolated, remove air flow xmtr. from system in 5 mins. with no procedural errors.	

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EVENTS		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.2 White Smoke	2.13.3	Insert Cal. and Rep	[ ]	[ ]	[ ]	
	2.13.4	Reinstall and reconnect air flow xmtr.	Mot use hsnd tools to reinstall and reconnect		Given a repsired snd recalibrsted air flow xmtr. reinstall snd reconnect in system in 5 min. with no procedural errors	
	2.13.5	Open air supply and sensing lines to air flow xmtr.	Mot	Location		
	2.13.6	Parallel boiler master A/M sta. indicators	Per Mot			
	2.13.7	Shift FO A/M to auto [ST 4]	[ST 4]	[ST 4]		
	2.13.7	Shift FDB A/M to auto. [ST 4]	[ST 4]	[ST 4] Console is now in one knob remote man. control on boiler master A/M sta.	Given an operating console with air flow xmtr. fault removed determine from console front indications, periscope and smoke density meter that system now has ability to steam with clesr stack in 3 min.	
		Stack not clear procede to 1.3.1.3.3				
	2.14	Observe that white smoke condition has been corrected				
Concludea white smoke event	2.15	Return control to operator				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Water Level Excursion		Take control of console from operator	Org.-relieves operator on portion of control under consideration			Maintainance man will find feed system in manual and pump control in auto.
1.3.3 Low Water	1.	Reproduce event	Per mot	Symptom as related by operator	Given an operating console on which operator corrective aciton has been taken reproduce event within 1 min. 100% accurate	
	1.1.	Shift feed water A/M sta. to auto [ST 4]	[ST 4]	[ST 4]		
	1.2	Observe ↓ water level	Per.-observe drum le el indicator	Location of indicator (on console)		
	2	Make observation on console				
	2.1	Observe Feed A/M O/P ↑ to 100% proceed to 1.3.3.5	Diag.-observes feed A/M O/P while water level ↓ to determine if trouble located upstream	Sys. oper. feed A/M O/P ↑ to 100% with ↓ water level indicates trouble is located upstream of feed A/M	Given an operating console that indicates feed A/M O/P ↑ to 100% as water level determines from the display that trouble is located upstream of the feed A/M sta. in 1 min 100%	
	2.2	Observe feed A/M O/P ↑ to 100%	Diag.-observes feed A/M O/P ↑ to determine if trouble located down stream	Sys. oper. feed A/M O/P ↑ to 100% with ↓ water level indicates trouble is located in feed valve or valve position er. (located in space)	Given an operating console that indicates feed A/M O/P ↑ to 100% with ↓ water level determines from display that trouble is located in feed valve or valve position in 1 min 100%	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 Low Water	2.2.1	Observe feed valve positioner O/P ↓ as A/M O/P ↑ Proceed to 1.3.3.4	Diag.-observes feed valve positioner O/P as A/M O/P ↑ (posit. O/P gage at posit. in space)	Valve positioner O/P ↓ as A/M O/P ↑ indicates trouble is in valve or power device	Given a display indicating valve positioner ↓ as A/M O/P ↑ . determines that trouble is located in feed valve or power device 1 min. 100%	
	2.2.2	Observe feed valve positioner O/P ↓ as A/M O/P ↑		Valve positioner O/P ↓ as A/M O/P ↑ indicates trouble is in valve positioner	Given a display indicating valve positioner as A/M O/P ↑, determines that trouble is located in valve positioner 1 min. 100%	
	3	Corects fault in feed valve positioner			Given a feed valve positioner in which a fault has been placed, isolate feed valve positioner in 2 min 100%	
	3.1	secure affected boiler				Watch stander will secure boiler, boiler must be secured while positoner is O.O.C. because there is no control over feed flow
	3.2	Shut air supply to affected feed valve positioner	Mot	Location (at posit. in space)		
	3.3	Set feed A/M O/P a "0"%	Per mot			
	3.4	[Insert repair procedure]	Mot [ ]	Valve positioner is repaired in place	[ ]	
	3.5	Open supply air to feed valve positioner			Deisolate	
	3.5	[Insert calib. procedure]	[ ]	Valve positioner is calib. in place using portable calib. set	[ ]	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 Low Water	3.6	Observe positioner O/P↓ as feed A/M O/P↑	Per mot	sys. oper.	Given a repaired & recalib. feed valve positioner, and a display indicating positioner O/P↓ as feed A/M O/P↑ determine that valve positioner is functioning properly in 1 min. 100%	
	3.7	Inform top watch that boiler is now operational	Org.			
	4	Observe that feed valve does not position in response to varying valve positioner output corrects fault in feed valve secure affected boiler	Diag.-observe feed valve stroke in response to valve positioner O/P	Length of stroke vs. positioner output	Given a feed flow control valve which does not respond to varing valve positioner O/P, isolate & repair feed flow control valve. in 1 hour alter boiler is secured	
	4.1	Correct fault in feed valve				
	4.1.1	Secure affected boiler				
	4.1.2	Close feed flow control valve inlet & outlet valves				
	4.1.3	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	4.1.4	Manipulate feed A/M O/P from 0 to 100% in remote manual-and observe feed flow control valve respond	Diag.-observe feed flow control valve stroke in response to A/M O/P	Length of stroke vs. A/M O/P	Given a repaired and recalibrated feed flow control valve and a feed A/M display, manipulate feed A/M O/P from 0 to 100% and observe feed flow control valve stroke from fully closed to fully open in response to A/M sta. O/P in 5 min.	No deisolation procedure here because boiler is still secured and isolation valve will not be opened until boiler is lit off.

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 Low Water	4.1.5	Inform top watch that boiler is now operational (boiler must be put back into service in order to continue FAS)	Ops.			
	5	Observe upstream feed loop				
	5.1	Shift feed A/M to remote manual and remove NWL [ST 3]	[ST 3]	[ST 3]NWL is required for subsequent operations	[ST 3]	
	5.2	Observe S/F xmtr. O/P = to F/F xmtr. O/P Proceed to 1.3.3.7	Diag.-Observe S/F xmtr and F/F xmtr. O/P's to determine if they are = (gages on xmtrs in space)	Sys. oper. if S/F xmtr and F/F xmtr O/P's are = they are operating properly. Indicators must be within ± 2% at steady static & controling NWL in remote manual	Given a display indicating S/F xmtr. O/P = to F/F xmtr. O/P, determines from display that S/F xmtr. & F/F xmtr. are not the source of trouble in 1 min. 100%	
	5.3	Observe S/F xmtr. O/P ≠ F/F xmtr. O/P	Diag.-observe S/F xmtr and F/F xmtr. O/P's to determine if they are = (gages on xmtrs in space)	S/F xmtr≠F/F xmtr indicates trouble is in S/F xmtr. or F/F xmtr.	Given a display indicating S/F xmtr. ≠ F/F xmtr. O/P, determines that either S/F xmtr or F/F xmtr. are the source of trouble	
	5.4	Compare S/F xmtr & F/F xmtr. O/P's with plant demand	Diag.	S/F xmtr./F/F xmtr.O/P vs.plant demand if either xmtr O/P deviates ± 10% from	Given a display indicating a S/F xmtr. or F/F xmtr. demand by at least ± 10%	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 cont. Low Water	5.4	Continued		indicated demand at steady state w/4 burners in operation indicate that xmtr. is source of trouble	Determines which xmtr. is malfunctioning in 1 min. with 100% accuracy	
	6	Corrects fault in xmtr.			Given a xmtr. into which s fault has been placed equalize isolate xmtr. in 3 min w/no procedural error	
	6.1	Open equalizing valve on xmtr.		Location of valves (at xmtr. in space)		
	6.2	Shut sensing line valves	Mot	Location of valves (in space)		
	5.3	Blow down sensing to bilges				
	6.3.1	Open drain valve	Mot	(in space)		
	6.3.2	Blow down until all pressure is relieved	Per mot observe vent while opening valve	Person must be clesr of vent while blowing down		
	6.4	Disconnect & remove xmtr if required	Mot-use hand tools to disconnect & remove			Some xmtrs. may be repaired in place depending on ships configuration.
	6.5	[Insert repair & calib]	[ ]	[ ]	[ ]	
	6.6	Reinstall & reconnect if xmtr. was removed			Given s repaired and recalibrated xmtr. reinstall & reconnecting 10 min. w/o procedural error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 cont. Low Water	6.7	Place xmtr. in service [ST 5]	[ST 5]	[ST 5]	[ST 5]	
	6.8	Observe S/F xmtr. O/P = F/F xmtr. O/P at ~30 psi	Diag.	Location	[1.3.3.5.2]	
	6.9	Shift feed A/M to auto. [ST 4] and observe NWL now holds water level still decreases proceed to 1.3.3.7	Diag.	Band of NWL		
	6.10	Return control to operater	Orig.			[Insert 1.3.4.5]
	7	Check DL xmtr.				
	7.1	Shift feed A/M to man. [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	7.2	Slowly decrease W/L from NWL using feed A/M	Per-mot observe W/L indication as feed A/M comp. relay is turned in decrease direction	NWL location (gage glass)	Given an operating consoie with feed A/M in manual, decrease W/L in a control co manner while making observet-ions	
	7.2.1	Observe D/L xmtr. O/P to be 30 psi @ NWL & O/P ↑ as W/L ↓	Diag. (gage at D/L xmtr. in spsce)	NWL band & safe lower limit	Given a displsy indicating a slowly decreasing W/L determines that D/L xmtr. O/P is at 30 psi @ NWL snd that D/L output ↑ as W/L ↓ indicates that D/L xmtr. is not source of trouble in 2 min. 100%	
	7.2.1.1	Restore NWL Proceed to 1.3.3.9	Per mot-raise W/L to NWL by turning feed A/M comp. relay in increase direction	NWL bsnd	Given sn operating console with feed A/M in manual snd a W/L below NWL. raise W/L to NWL in 2 min. 100%	

EVENT		TASK	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 cont. Low Water	7.2.2	Observe D/L xmtr. O/P ≠ 30 psi @ NWL $ O/P ↑ as W/L ↓	Diag.	NWL band & sale lower limit	Given a display indicating a slowly decreasing W/L determines that D/L xmtr. O/P ≠ 30 psi @ NWL & that O/P as ↑ W/L ↓ indicates that D/L xmtr. is source of trouble in 2 min 100%	
	8.	Corrects fault in D/L xmtr.			Given a xmtr. into which a fault has been placed equalize isolate xmtr. in 3 min. w/no proceudral error	
	8.1	Open equalizing valve on xmtr.		Location of valves (at xmtr. in space)		
	8.2	Shut sensing line valves	Mot	Location of valves (in space)		
	8.3	Blow down sensing to bilges				
	8.3.1	Open drain vlave	Mot	(in space)		
	8.3.2	Blow down until all pressure is relieved	Per mot observe vent while opening valve	Person must be clear of vent while blowing down		
	8.4	Disconnect & remove xmtr. if required	Mot-use hand tools to disconnect & remove			Some xmtrs. may be repaired in place depending on ships configuration
	8.5	[Insert repair & Calib]	[ ]	[ ]	[	
	8.6	Reinstall & reconnect if xmtr. was removed			Given a repaired and recalibrated xmtr. reinstall & reconnecting in 10 min. w/out procedural error	
	8.7	Place xmtr. in service [ST 5]	[ST 5]	[ST 5]	[ST 5]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 Low Water	8.8	Adjust D/L xmtr. O/P to 30 psi using D/L xmtr zero spring with W/L at desired level	Per mot	NWL Band	Given a repaired and re-calibrated D/L xmtr. in service, adjust D/L xmtr. O/P to 30 psi using zero spring with W/L at desired level in 1 min. 100%	
	8.9	Shift feed A/M to auto. [ST 4]& observe system holding NWL in auto. system will not maintain NWL proceed to 1.3.9	[ST 4]	[ST 4]sys. oper.	[ST 4]	
	8.10	Return control to operator				
	9	Check D/L totalizer	(under console)			

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENT
1.3.3 Low Water	9.1	Shift feed A/M to manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	9.2	Slowly decrease W/L from NWL using feed A/M	Per mot		[1.3.3.7.2]	
	9.2.1	Observe D/L totalizer O/P = 30 psi @ NWL & O/P↓ as W/L ↓	Diag. (gage under console)	Sys. oper.	Given a display indicsting a slowly decreasing W/L determines that D/L totalizer O/P = 30 psi @ NWL and O/P↓ as W/L↓ indicates that D/L totalizer is not the source of trouble and feed flow controller is the only component left in 2 min 100%	
	9.2.1.1	Restore NWL proceed to 1.3.3.1.1			[1.3.3.8.2.1.1]	
	9.2.2	Observe D/L totalizer O/P ≠ 30 psi @ NWL & O/P↓ as W/L↓	Diag.	Sys. oper.	Given a display indicating a slowly decreasing W/L determines thst D/L O/P ≠ 30 psi @ NWL and that O/P↓ as W/L↓ indicates D/L totalizer ss a source of trouble in 2 min 100%	
	10	Corrects fault in D/L to totalizer				
	10.1	Shut air supply valve to D/L xmtr.	Mot	Location (at xmtr in space)	Given an operating console into which a D/L totalizer fault has been plsced, isolste and remove D/L totalizer in 5 min. w/o error	
	10.2	Shut air supply valve to S/F F/F relay	Mot	Location (under console)		
	10.3	Shut air supply valve to D/L totalizer	Mot	Location (under console)		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 Low Water	10.4	Disconnect & remove D/L totalizer	Not use hand tools to disconnect & remove D/L totalizer			
	10.5	[Insert repair & calib]				
	10.6	Reinstall and reconnect D/L totalizer			Given a repaired & recalib. D/L totalizer reinstall & reconnect in system and de-isolate	
	10.7	Open supply air valve to D/L totalizer				
	10.8	Open supply air valve to D/L xmtr.				
	10.9	Open supply air valve to S/F, F/F "relays"				
	10.10	Slowly decrease W/L from NWL using feed A/M			[1.3.3.7.2]	
	10.10	Observe D/L totalizer O/P now = 30 psi @ NWL & O/P ↓ as W/L ↓			[1.3.3.9.2.1	
	10.11	Shift feed A/M to auto. [ST 4]& observe sys. holding NWL in auto. sys. will not maintain W/L proceed to 1.3.3.11	[ST 4]	[ST 4]	[ST 4]	
	10.12	Return control to oper.	Orig.			
	11	Check F/F controller		(under console)		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENT
1.3.3 cont. Low Water	11.1	Observe that F/F controller output is not stable W/= inputs from S/F-F/F relay & D/L totalizer, and F/F controller O/P does not go to 60 psi when D/L totalizer O/P is ↓ below S/F-F/F relay O/P	Diag.-per-mot decrease D/L totalizer O/P by turning feed A/M comp. relay in decreasing direction to decrease W/L	Sys. oper. (gage under console)	Given an operating console in which a F/F controller fault has been placed, determine that F/F controller O/P is eratic W/=I/P from S/F-F/F relay & D/L totalizer and that F/F controller O/P does not go to 60 psi when D/L totalizer O/P is ↓ below S/F -F/F relay O/P indicates that F/F controller is source of trouble in 2 min 100%	No decision set here since it is last componet in the loop
	12	Corrects fault in F/F controller				
	12.1	Shut supply air valve to S/F-F/F relay	Mot	Location (under console)	Given an operating console in which a A/F controller fault has been placed, isolate and remove F/F controller in 5 min w/o error	
	12.2	Shut supply air valve to D/L totalizer	Mot	Location (under console)		
	12.3	Shut supply air valve to F/F controller	Mot	Location (under console)		
	12.3	Shift control of feed flow control valve to local manual	Mot	Location (in space)		Operator will control W/L in local manual
	12.4	Decrease feed A/M manual O/P to "0" psi	Per mot	Location		
	12.5	Disconnect & remove F/F controller	Mot use hand tool to disconnect & remove	Location (under console)		
	12.6	[Insert repair & calib.]	[ ]	[ ]	[ ]	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.3 cont. Low Water	12.7	Reinstall and reconnect F/F controller	Mot		Given a repaired & recalib. F/F controller, reinstalls reconnect in system and de-isolates F/F controller in 5 min min. w/o error	
	12.8	Shift control of feed flow control valve to remote manual	Mot			
	12.9	Open supply air valve to F/F controller	Mot			
	12.10	Open supply air valve to S/F-F/f relay	Mot			
	12.11	Open supply air valve to D/L totalizer	Mot			
	12.12	Slowly decrease W/L from NWL	Per mot		[1.3.3.7.2]	
	12.13	Observe that F/F controller O/P is stable w/-I/P from D/L totalizer & S/F-F/F relay, a and that O/P to 60 psi when D/L totalizer	Diag. Per-mct	Sys. oper (F/F cont. O/P is feed A/M O/P on console)	Given a display indicating a stable F/F controller O/P when I/P's from D/L totalizer & S/F-F/F relays are =, and that O/P to 60 psi when D/L totalizar O/P is decreased below S/F F/F relay O/P, determinas that system cna now maintain W/L	
	12.14	Shift feed A/M to auto. [ST 4]and observe sys. holding W/L in auto.				
Concludes low water	12.15	Return control to oper.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
High Water 1.3.4	1	Take control of console from operator	Org.-relieves operator on portion of console under consideration			Maintain man. will find feed in man. MFP in auto.
	1.1	Reproduce event	Per mot	Symptoms, as related by oper.	Given an operating console on which operator corrective action has been taken reproduce event within 1 min.	
	1.1.1	Shift feed water A/M station to auto.	[ST 4]	[ST 4]	[ST 4]	
	1.1.2	Observe ↑ water level	Per-Observe D/L indicator	Location of indic. on console		
	2	Make observation on console				
	2.1	Observe feed A/M O/P ↓ to 0% proceed to 1.3.4.5	Diag.-observes feed A/M while W/L ↑ to determine if trouble located upstream of A/M	Sys. oper. indicates trouble is upstream of feed A/M	Given a display indicating feed A/M O/P ↓ to 0% as W/L ↑ determine that trouble is located upstream of feed A/M in 1 min w/100% accuracy	
	2.2	Observe feed A/M O/P ↓ to 0%	1.3.4.2.1 Diag. observes feed A/M while W/L to determine if trouble located upstream of A/M	Sys. oper. indicates trouble is downstream of feed A/M	Given a display indicating feed A/M O/P ↓ to 0% as W/L ↑ determine that trouble is located downstresm of feed A/M in 1 min. w/100% accuracy	
	2.2.1	Observe feed valve positioner O/P ↑ as feed A/M O/P ↓ proceed to 1.3.4.4	Diag. observes feed valve position O/P as A/M O/P ↓	Valve position O/P ↑ as A/M O/P ↓ indicates trouble is in valve or power device	Given a display indicating positioner O/P ↑ as A/M O/P ↓ determine that trouble is in valve or power device in 1 min. w/100% accuracy	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 cont. High Water	2.2.2	Observe feed valve positioner O/P ↑ as feed A/M O/P ↓	1.3.4.2.2.1	Valve posit.. O/P ↑ as A/M O/P ↓ indicates trouble ia in positioner	Given a display indicating positioner O/P ↑ as A/M O/P ↓ determine that positioner is source of trouble in 1 min. w/100% accuracy	
	3.	Corrects fault in feed falve positioner			Given a feed valve positioner in which a fault has been placed, isolate feed vlave positioner in 2 min 100%	
	3. 1	Secure affected boiler				Watch stander will secure boiler, boiler must be secured while positioner is 0.0.C because there is no control over feed flow
	3.2	Shut air supply to affected feed valve positioner	Mot	Location (at posit. in space)		
	3.3	Set feed A/M O/P a "0"%	Per Mot			
	3.4	[Insert repair procedure]	Per Mot [ ]	Valve positioner is repaired in place	[ ]	
	3.5	Open supply air to feed valve positoner			Deisolate	
		[Insert calib. procedure]	[ ]	Valve positioner is calib. in place using portable calib set	[ ]	
	3.6	Observe positioner O/P ↓ as feed A/M O/P ↑	Per mot	Sys. oper.	Given a repaired & recalib. feed vlave positioner, and a display indicating positioner O/P ↓ as feed A/M O/P ↑ determine that valve positioner is functioning properly in 1 min 100%	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	3.7	Inform top watch that boiler is now operational	Org.			
	4	Observe that feed valve does not position in response to varying valve positioner O/P	Diag.-observe feed valve stroke in response to valve positioner O/P	Length of stroke vs. positioner O/P	Given a feed control valve which does not respond to varying valve positioner O/P isolate & repair feed flow control valve in 1 hr. after boiler is secured w/no procedural error	
	4.1	Corrects fault in feed valve				
	4.1.1	Secure affected boiler				
	4.1.2	Close feed flow control valve inlet & outlet valves				
	4.1.3	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	4.1.4	Manipulate feed A/M O/P from 0 to 100% in remote manula- and observe feed flow control vlave respond	Diag.-observe feed flow control valve stroke in response to A/M O/P	Length of stroke vs. A/M O/P	Given a repaired and racalibrated feel flow control vlave and a feed A/M display, manipulate feed A/M O/P from 0 to 100% and observe feed flow control valve stroke form fully closed to fully open in response to A/M sta. O/P in 5 min.	No deisolation procedure here because boiler is still secured and isolation vlave will not be opened until boiler is let off
	4.1.5	Inform top watch that boiler is now operational (boiler must be put back into service in order to continue FAS)	Org.			

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5	Observe upstream feed loop				
	5.1	Shift feed A/M to manual & restore NWL [ST 3]	[ST 3]	[ST 3]NWL is required for subsequent operations	[ST 3]	
	5.2	Observe S/F xmtr. O/P = to F/F xmtr. O/P proceed to 1.3.4.5.4	Diag.-observe F/F xmtr. & F/F xmtr. O/P to determine if they are =	Sys. oper. S/F xmtr. O/P = F/F xmtr. O/P indicate both xmtrs. are operating properly, signals must be within 2% & at steady state	Given a diaplay indicating S/F xmtr O/P = F/F xmtr O/P determine that S/F xmtr. & F/F xmtrs are not source of trouble in 1 min w/100% accuracy	
	5.3	Observe S/F xmtr. O/P ≠ F/F xmtr. O/P	1.3.4.5.2 Diag. Observe S/F xmtr. & F/F xmtr. O/P to determine if they are =	Sys. oper. S/F xmtr. O/P = F/F xmtr. O/P indicates both xmtrs are operating oroperly, signala must be within 2% at steady atate	Given a diaplay indicating S/F xmtr. ≠ F/F xmtr. O/P determine that S/F xmtr. or F/F xmtr. is source of trouble	
	5.3.1	Compare S/F xmtr. & F/F xmtr. O/P's with plant demand	Diag.	S/F xmtr. F/F xmtr. O/P vs. plant demand if either xmtr. O/P deviates ± 10% from indicated demand st ateady state w/4 burners in operation indicste that xmtr. is source of trouble	Given a display indicating a S/F xmtr. or F/F xmtr. that deviates from plant demand by at least ± 10% determines which xmtr. ia malfunctioning in 1 min. with 100% accuracy	
	5.3.2	Correct fault in S/F xmtr. or F/F xmtr.				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.3.2.1	Open equalizing valve on xmtr.		Location of valve (at xmtr. in apace)		
	5.3.2. 2	Shut sensing line valve	Mot	Location of valves (in space)		
	5.3.2. 3	Blow down sensing to bilges .				
	5.3.2. 3.1	Open drain valve	Mot	(in space)		
	5.3.2. 3.2	Blow down until all pressure is relieved	Per mot observe vent while opening vlave	Person must be clear of vent while blowing down		
	5.3.4	Disconnect & remove xmtr. if required	Mot-use hand tools to disconnect & remove			Some xmtrs. may be repaired in place depending on ships configuration
	5.3.2.5	Insert repair & calib.]	[ ]	[ ]	[ ]	
	5.3.2. 6	Reinstall & reconnect if xmtr. was removed			Given a repaired and recalibrated xmtr. reinstall & reconnecting 10 min. w/o procedural error	
	5.3.2. 7	Place xmtr. in service [ST 5]	[ST 5]	[ST 5]	[ST 5]	
	5.3.2.8	Observe S/F xmtr. O/P = F/F xmtr. O/P at ~ 30 psi	Diag.	Location	[1.3.3.5.2]	
	5.3.2.9	Shift feed A/M to auto. ST 4 and observe NWL now holds water level still decreases proceed to 1.3.3.7	Diag.	Band of NWL		
	5.3.2. 10	Return control to operator	Orig.			[Insert 1.3.4.5]

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.4	Check S/F-F/Freley				
	5.4.1	Observe O/P of S/F-F/F relay = 30 psi proceed to 1.3.4.5.5	Diag.	Sys oper.-sys. must be at steedy state w/NWL	Given a display indicating e S/F-F/F relay W/30 psi O/P, determins thet S/F-F/F relay is not source of trouble in 1 min. w/100% accuracy	
	5.4.2	Observe S/F-F/F relay O/P ≠30 psi w/steady state system.	Diag.	Sys. oper.-sys. must be at steady state w/NWL	Given a display indicating a S/F-F/F relay w/O/P ≠ 30 psi, determine thet S/F-F/F relay is source of trouble in 1 min w/100% accuracy	
	5.4.2.1	Shift feed A/M to manuel	[ST 3]	[ST 3]	[ST 3]	
	5.4.2.2	Shut supply eir to S/F F/F relay	Mot	Location of valve	Given e display conteining a S/F-F/F relay in which e fault has been pleced, isolete, disconnect & remove from system in 5 min. w/o procedurel error	
	5.4.2.3	Shut supply air to S/F xmtr. & F/F xmtr.	Mot	Location of valves		
	5.4.2.3	Disconnect & remove S/F F/F relay	Mot-use of hand tools			
	5.4.2.4	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	5.4.2.5	Install & reconnect S/F F/F relay	Mot-use of hand tools		Given a diaplay install, reconnect & deisolate S/F - F/F relay in which a fault has been repeired in 5 min. w/o procedural error	
	5.4.2.6	Open supply air to S/F-F/F relay	Mot	Location of valve		

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.4.2.7	Open supply air to S/F xmtr. & F/F xmtr.	Mot.	Location of valve		
	5.4.2.8	Observe S/F-F/F relay O/P = 30 psi w/steady state system.	Diag.	Sys. oper.	1.3.4.5.4.1	
	5.4.2.9	Shift feed A/M to auto & return control to operating [ST 4] Fault not corrected proceed to 1.3.4.5.5	[ST 4]	[ST 4]	[ST 4]	
	5.5	Check D/L xmtr.				
	5.5.1	Shift feed A/M to man. [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	5.5.2	↑ W/L using feed A/M	Per mot-observe W/L indicator as feed A/M ia turned in increase direction	NWL band & aafe upper limit	Given an operating console w/feed A/M in man.↑ W/L in e controlled manner while making observetione	
	5.5.3	Observe D/L xmtr. O/P = 30 psi @ NWL & ↓ as W/L ↑	Diag.	NWL band & safe upper limit	Given a diapley indicating D/L xmtr. O/P = 30 psi @ NWL & D/L xmtr. O/P aa W/L determine that D/L xmtr. ia not source of trouble in 2 min. w/100% accurach	
	5.5.3.1	Reatore NWL proceed to 1.3.3.5.6	Per mot-lower W/L to NWL using feed A/M	NWL band	Given en operating console w/feed in man.↓ W/L to NWL in 2 min. w/100% accuracy	
	5.5.4	Observe D/L xmtr. O/P ≠ 30 psi @ NWL & O/P ↓ as W/L ↑	Dia.	NWL band & safe upper limit	Given a display indicating D/L xmtr. O/P ≠ 30 psi @ NWL & O/P ↓ as W/L↑ determine that D/L xmtr. ie source of trouble in 2 min. w/100% accuracy	

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EVENT		TASK	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.5.4.1	Corrects fault in O/L xmtr.			Given a xmtr. into which a faulty has been placed equalize isolate xmtr. in 3 min. w/no procedural error.	
	5.5.4.1.1	Open equalizing valve on xmtr.		Location of valves (at xmtr. in space)		
	5.5.4.1.2	Shut sensing line valve	Mot	Location of valves (in space)		
	5.5.4.1.3	Blow down sensing to bilges				
	5.5.4.1.3.1	Open drain valve	Mot	(in space)		
	5.5.4.1.3.2	Blow down until all pressure is relieved	Per mot observe vent while opening valve	Person must be clear of vent while blowing down		
	5.5.4.1.4	Disconnect & remove smtr. if required	Mot-use hand tools to disconnect & remove			Some xmtrs. may be repaired in place depending on ships configuration
	5.5.4.1.5	Insert repair & calib.	[ ]	[ ]	[ ]	
	5.5.4.1.6	Reinstall & reconnect if xmtr. was removed			Given a repaired and recalibrated xmtr. reinstall & reconnecting in 10 min. w/out procedural error	
	5.5.4.1.7	Place xmtr. in service [ST 5]	[ST 5]	ST 5]	[ST 5]	
	5.5.4.1.8	Adjust D/L xmtr. O/P to 30 psi using D/L xmtr. zero spring with W/L at desired level	Per mot	NWL band	Given a repaired and recalibrated D/L xmtr. in service, adjust D/L xmtr. O/P to 30 psi using zero spring with W/L at desired level in 1 min 100%	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.5.4.1.9	Shift feed A/M to auto. [ST 4] observe system holding NWL in auto system will not maintain NWL proceed to 1.3.3.9	[ST 4]	[ST 4] sys. oper.	[ST 4]	
	5.5.4.1.10	Return control to operator				
	5.6	Check D/L totalizer				
	5.6.1	Shift feed A/M to man. [ST 3]	[ST 3]	[ST 3]	[ST3]	
	5.6.2	Slowly ↑ W/L using feed A/M	Per mot	NWL & safe band		
	5.6.3	Observe D/L totalizer /P ≠ 30 psi @ NWL & O/P ↑ as W/L ↑	Diag.	Sys. oper.	Given a display indicating a D/L totalizer w/O/P = 30 psi @ NWL & O/P ↑ as W/L ↑, determine that D/L totalizer is is not source of trouble in 2 min. w/100% accuracy	
	5.6.3.1	Restore NWL, proceed to 1.3.4.5.7			1.3.4.5.4.3.1	
	5.6.4	Observe D/L totalizer O/P ≠ 30 psi @ NWL & O/P ↓ as W/L ↑	Diag.	Sys. oper.	Given a display indicating a D/L totalizer w/ O/P ≠ 30 psi @ NWL & O/P ↓ as W/L determine that D/L totalizer is source of trouble in 2 min. w/100% accuracy	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.6.4.1	Corrects fault in D/L to totalizer				
	5.6.4.1.1	Shut air supply valve to D/L xmtr.	Mot	Location (at xmtr. in space)	Given an opersting console into which a D/L totalizer fault has been place, isolate and remove D/L totslizer in 5 min w/o error	
	5.6.4.1.2	Shut air supply valve to S/F F/F relay	Mot	Location (under console)		
	5.6.4.1.3	Shut air supply valve to D/L totalizer	Mot	Location (under console)		
	5.6.4.1.5	Disconnect & remove D/L totalizer	Mot use hand tools to disconnect & remove D/L totalizer			
	5.6.4.1.5	[Insert repair & calib.]				
	5.6.4.1.6	Reinstall and reconnect D/L totalizer			Given a repaired & recalib. D/L totalizer reinstall & reconnect in system and deisolate	
	5.6.4.1.7	Open supply air valve to D/L totalizer				
	5.6.4.1.8	Open supply air valve to D/L xmtr.				
	5.6.4.1.9	Open supply air valve to S/F, F/F "relays"				
	5.6.4.1.10	Slowly decrease W/L from NWL using feed A/M Observe D/L totalizer O/P now = 30 psi @ NWL & O/P ↓ as W/L ↓			[1.3.3.7.2]	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.6.4.1.11	Shift feed A/M to auto. [ST 4] observe sys. holding NWL in auto sys. will not maintain W/L proceed to 1.3.3.11	[ST 4]	[ST 4]	[ST 4]	
	5.6.4.1.12	Return control to oper.	Orig.			
	5.7	Check F/F controller				
	5.7.1	Observe that F/F cont. O/P is not stable W/= I/P from S/F-F/F relay & D/L totalizer & I/F cont O/P ↓ to 0 psi when D/L totalizer O/P is ↑ above S/F-F/F relay O/P	Diag. per mot ↑ D/L tot. O/P by turning feed A/M in increasing direction ↑ W/L	Sys. oper.	Given an operating console in which a F/F cont. fault has been placed, determine that F/F controller is source of trouble in 2 min. w/100% accuracy	
	5.7.2	Corrects fault in F/F controller				
	5.7.2.1	Shut supply air valve to S/F-F/F relay	Mot	Location (under console)	Given an operating console in which a A/F controller fault has been placed, isolate and remove F/F controller in 5 min. w/o error	
	5.7.2.2	Shut supply air valve to D/L totalizer	Mot	Location (under console)		
	5.7.2.3	Shut supply air valve to F/F controller	Mot	Location (under console)		
	5.7.2.3	Shift control of feed flow control valve to local manual	Mot	Location (in space)		Operator will control W/L in local manual
	5.7.2.4	Decrease feed A/M manual O/P to "0" psi	Per mot	Location		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.4 High Water	5.7.2.5	Disconnect & remove F/F controller	Mot use hsnd tool to disconnect & remove	Location (under console)		
	5.7.2.6	[Insert repair & cslib.]	[ ]	[ ]	[ ]	
	5.7.2.7	Reinstall and reconnect F/F controller	Mot		Given a repsired & recalib. F/F controller, reinstalls reconnect in system and deisolates F/F controller in 5 min. w/o error	
	5.7.2.8	Shift control of feed flow control valve to remote manual	Mot			
	5.7.2.9	Open supply air valve to F/F controller	Mot			
	5.7.2.10	Open supply air valve to S/F-F/F relsy	Mot			
	5.7.2.11	Open supply air valve to D/L totalizer	Mot			
	5.7.2.12	Slowly decrease W/L from NWL	Per mot		[1.3.3.7.2]	
	5.7.2.13	Observe that F/F controiler O/P is stable w/-I/P from D/L totalizer & S/F-F/F relsy, a and that O/P to 60 psi when D/L totalizer	Diag. Per-mot	Sys. oper (F/F cont. O/P is feed A/M O/P on console)	Given a displsy indicsting a stable F/F controiler O/P when I/P's from D/L totalizer & S/F-F/F relays are =, and that O/P to 60 psi when D/L totalizer O/P is decreased below S/F F/F relay O/P, determines that system can now maintain W/L	
	5.7.2.14	Shift feed A/M to suto. [ST 4] and observe sys. holding W/L in auto.				
Concludes High water event	5.7.2.15	Return control to oper.				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENT
Steam Pressure Excursion 1.3.5 Low Stm. Press.	1	Take control of console from operator				Maint. man. will find fuel in man.-air in man-&boiler master in man.
	1.1	Reproduces event				
	1.1.1	Shift FO A/M to auto. [ST 4]	Per mot	[ST 4]	[ST 4]	
	1.1.2	Shift FDB master A/M to auto. [ST 4]	Per mot	[ST 4]	[ST 4]	
	1.1.3	Shift boiler master A/M to auto. [ST 1]	Per mot	[ST 1]	[ST 1]	
	1.1.4	Observe ↓ stm. pressure	Per.			
	2	Make observations on console				
	2.1	Observe boiler master A/M O/P ↑ W/zero bias to 100% as stm. press ↓ below 1275 psi proceed to _____	Diag.	Sys. oper. That boiler master A/M should reach 100% as stm. press. ↓ to 1265 psi (stm. press gage on console)	Given an operating console indicating a decreasing stm. press. determines from display that boiler master O/P to 100% as stm. press. ↓ below 1275 psi indicating that demand loop is not the source of trouble 30 sec. 100%	
	2.2	Observe boiler master A/M O/P ↑ to 100% as stm. press. ↓ below 1275 psi	Diag.	Sys. oper. that boiler msster A/M should reach 100% as stm. press. ↓ to 1265 psi (stm. press. gage on console)	Given an operating console indicating s decreasing stm. press., determine from the display that boiler master O/P ↑ to 100% as stm. press. ↓ below 1275 psi indicates that trouble is located in demand loop in 30 sec. 100%	
	2.2.1	Observe that boiler master A/M O/P tracks I/P proceed to 1.3.5.4	Diag.	Sys. oper.	Given a display indicating boiler master A/M O/P ↑ = I/P ↑ determines that A/M station is not source of trouble and that problem is located in upstream demand loop in 30 sec. 100%	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	2.2.2	Observe boiler master A/M O/P does not track I/P	Diag.	Sys. oper.	Given a display indicating boiler master A/M O/P↑ & I/P↑ determines that boiler master A/M station is source of trouble in 30 sec. 100%	
	3	Corrects fault in boiler master A/M station			Given a boiler master A/M sta. in which a fault has been placed isolate, disconnect & remove the comp. relay in 5 min. w/o error	
	3.1	Shift boiler master A/M to manual [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	3.2	Shift FDB master A/M to manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	3.3	Shift FO A/M to manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	3.4	Shut supply air valve to comp. relay	Mot	Location (under console)		
	3.5	Disconnect & remove compensating relay	Mot-use hand tools to disconnect & remove	Location (under console)		
	3.6	[Insert repair & calib]	[ ]	[ ]	[ ]	
	3.7	Reinstall & reconnect comp. relay			Given a repaired & recalib. comp. relay, reinstall and reconnect in system & deisolate in 5 min. w/o error	
	3.8	Open supply air to comp. relay				
	3.9	Shift FO A/M sta. to auto.	[ST 4]	[ST 4	[ST 4]	
	3.10	Shift FDB master A/M to auto.	[ST 4]	[ST 4]	[ST4]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	3.11	Shift boiler master A/M to auto.	[ST 1]	[ST 1]	[ST 1]	
	3.12	Observe that boiler master A/M O/P now tracks I/P now stm. press. cond. not cleared proceed to 1.3.5.4	Diag.	Sys. oper.	[1.3.5.2.2.1]	
	3.13	Return control to oper.				
	4	Check inverting relay		(under console)		
	4.1	Observe that inverting relay O/P = 60 psi-O/P of high signal selector proceed to 1.3.5.6	Diag.	Sys. oper. (gages under console)(High sig. selector under console)	Given a display indicating inverting relay O/P = 60 psi - O/P of high signal selector determines that inverting relay is not source of trouble & that problem is located upstream of inverting relay in 1 min. 100%	
	4.2	Observe that inverting relay O/P ≠ 60 psi - O/P of high signal selector	Diag.	Sys. oper.	Given a display indicating inverting relay O/P ≠ 60 psi - O/P of high signal selector, determines that inverting relay is source of trouble in 1 min. 100%	
	5	Corrects fault in inverting relay				
	5.1	Shift boiler A/M to remote manual [ST 1]	[ST 1]	[ST 1]	Given a console into which an inverting relay fault has been placed, isolate disconnect & remove inverting relay in 5 min. W/O error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	5.2	Shut supply air valve to inverting relay	Mot	Location of valve (under console)		
	5.3	Shut supply air valve to "A" & "B" steam pressure controllers	Mot	Location of valves (in space at controllers)		
	5.4	Disconnect & remove inverting relay	Mot-use hand tools to disconnect & remove	Location of invert. relay under console		
	5.5	[Insert repair & Calib]	Mot	[ ]	[ ]	
	5.6	Reinstall & reconnect inverting relay	Mot		Given a repaired & recalib. inverting relay, reinstall, reconnect in system & de-isolate	
	5.7	Open supply air valve to inverting relay	Mot	Location		
	5.8	Open supply air valve to "A" & "B" stm. press. controllers	Mot	Location		
	5.9	Observe that inverting relay O/P now = 60 psi -O/P of high signal selector			[1.3.5.4.1]	
	5.10	Shift boiler master A/M to auto.[ST 1]	[ST 1]	[ST 1]	[ST 1]	
	5.11	Return control to oper.				
	6	Check Stm. pressure controller				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	6.1	Observe that "A" or "B" stm. press. controller O/P ↓ to "0" psi as stm. press. below 1275 psi	Diag.	Sys. oper.- stm. press. controller O/P should reach "0" psi as atm. press. reaches 1265 pai (O/P gages at controllers in space)	Given a display indicating atm. press. controller O/P ↓ to "0" psi as stm. press. ↓ below 1275 psi determines that that stm. press. controller is not source of trouble in 1 min. 100%	
	6.2	Observe that "A" or "B" stm. press. controller O/P ↓ to 0 psi as stm. press. ↓ below 1275 psi	Diag. (steam press. gage on console & gage board)	Sys. oper. stm. press. controller O/P should reach 0 pai as stm. pre - press. reaches 1265 psi	Given a diaplay indicating stm. press. controller O/P ↓ to 0 psi as stm. press. ↓ below 1275 psi determines that stm. press. controller is source of trouble in 1 min. 100%	
	7	Correct fault in stm. press. controller				
	7.1	Shift boiler master A/M to remote manual [ST 2]	[ST 2]	[ST 2]	Given a steam preasure controller in which a fault has been placed, isolate, blow down, disconnect & remove from system, in 5 min. w/o error	
	7.2	Shut supply air valve to affected stm. press. controller	Mot	Location of valve (at controller)		
	7.3	Shut steam press. sensing line to steam press. controller	Mot	Location		
	7.4	Shut steam press. sensing line isolation valve at stm. press. controller	Mot	Location		

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	7.5	Open sensing line drain valve to bilges to relieve pressure and clear line	Mot	Personnel must be clear of vent while blowing down		
	7.6	Disconnect & remove stm. pressure controller	Mot			
	7.7	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	7.8	Reinstall & reconnect stm. pressure controller	Mot		Given a repaired & recalib. stm. pressure controller reinstall reconnect in sys. & deisolate in 5 min. w/o error	
	7.9	Shut sensing line drain valve	Mot			
	7.10	Open sensing line	Mot	Permit condensate to form in line until line is warm to touch		
	7.11	Open supply air valve to stm. pressure controller	Mot	Location		
	7.12	Observe that stm. press. controller O/P is stable w/stm. pressure at 1275 psi & O/P↓ as stm. press↓ below 1275 psi	Diag.	Sys. operation	[1.3.5.6.1]	
	7.13	Shift boiler master A/M sts. to auto.[ST 1]	[ST 1]	[ST 1]	[ST 1]	
	7.14	Return control to oper.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	8	Check upstream air loop				
	8.1	Shift FDB A/M sta. to remote manual ST 2	ST 2	ST 2	ST 2	
	8.2	Shift control of affected FDB to local manual	1.3.2.2.4.2	1.3.2.2.4 2	1.3.2.2.4.2	
	8.3	Check air flow rate relay				
	8.3.1	Observing that air flow rate relay O/P is = I/P from air flow controller	Diag. compare air flow rate relay O/P with I/P from air flow controller (Gages under console)	That plant must be at steady state in order to get air flow rate relay O/P = to I/P from air flow controller to eliminate air flow rate relay as a source of trouble	Given a display indicating air flow rate relay O/P = to I/P from air flow controller determine that air flow rate relay ia operating properly in 1 min 100%	
	8.3.2	Observe that air flow rate relay O/P ≠ to I/P from air flow controller	Diag. compare air flow rate relay O/P with I/P from air flow controller (gages under console)	That plant must be at steady state in order to get air flow rate relay O/P = to I/P from air flow controller to eliminate air flow rate relay as a source of trouble	Given a display indicating air flow rate relay O/P ≠ to I/P from air flow controller determine from display that aie flow rate relay is source of trouble in 1 min. 100%	
	9	Corrects fault in sir flow rate realy	Per mot		Location in syatem (under console)	
	9.1	Shift FO A/M sta. to remote manual [ST 3]	[ST 3]		[ST 3]	
	9.2	Shift FDB master A/M sta. to remote manual [ST 3]	[ST 3]		[ST 3] Console is now in two knob man. control location of valves (under console)	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	9.3	Shut air supply valves to excess air adjuster air flow controller and air flow rate	Mot	Location of valves (under console)		
	9.4	Disconnect & remove air flow rate relay				
	9.5	[Insert Repair & calib.]	[ ]	[ ]		
	9.6	Reinstall & reconnect air flow rate relay in system			Given a repaired & recalibrated air flow rate relay, reinstall and reconnect in system and deisolate in 5 min. w/o procedural erro	
		Open supply air valves to excess air adjuster air flow controller & air flow rate relay	Mot	Location of valves		
	9.7	Shift FO A/M sta. to auto [ST 4]	[ST 4]	[ST 4]		
	9.8	Shift FDB master A/M sta. to auto.[ST 4]	[ST 4]	[ST 4]		
	9.9	Observe that air flow rate relay O/P is now = to I/P from air flow controller, stack not clear proceeds to 1.3.2.2.9	Diag. - compare air flow rate relay O/P with air flow controller I/P	1.3.2.2.7.2.1	1.3.2.2.7.2.1	
	9.10	Return control to operator				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	10	Check air flow controller				
	10.1	Observe that air flow controller O/P to "0" psi when indicated air flow is above boiler demand. Stack not clear proceed to 1.3.2.2.1.1	Diag-per mot compare air flow controller O/P with indicator air flow	Sys. oper (A/F cont. O/P under console indic A/C on console)	Given an operating console that displays a "0" psi when air flow is above boiler demand determine from display that air flow controller is not the source of trouble 1 min 100%	
	10.2	Observe that air flow controller O/P to "0" psi when indicated air flow is above boiler demand	Diag.		Given an operating console that display a valve other than "0" psi when air flow is above boiler demand, determine from display that air flow controller is ths source of trouble in 1 min. 100%	
	11	Corrects fault in air flow controller	Per-mot	Location in system	Given an operating console in which an air flow controller fault has been placed isolate and remove air flow controller from system in 5 min. w/o procedural error.	
	11.1	Shift boiler master A/M to remote manual [ST 2]	[ST 2]	[ST 2]		
	11.2	Shift FOB master A/M to remote manual [ST 3]	[ST 3]	[ST 3]		
	11.3	Shift FO A/M sta. to remote manual [ST 3]	[ST 3]	[ST 3] Console is now in two knob control		
	11.4	Shut supply air to excess air adjuster & air flow controller	Mot	Location of valves (under console)		
	11.5	Set boiler master A/M at "0" psi	Per-mot & compensating relay while observing O/P indication	Sys. oper. "0" psi on boiler master A/M insulates air signal to air flow controller		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	11.6	Disconnect & remove air flow controller	Mot use hand tools to disconnect & remove	Location (under console)		
	11.7	[Insert cal. & repair]				
	11.8	Reinstall & reconnect air flow controller	Mot		Given a repaired & recalibrated air flow controller, reinstall reconnect in system & deisolate in 5 min. W/O procedural error	
	11.9	Oper. supply air to air flow controller & excess air adjuster				
	11.10	Shift FO A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]		
	11.11	Shift FDB master A/M to auto. [ST 4]	[ST 4]	[ST 4]		
	11.12	Shift boiler master A/M to auto. [ST 1]	[ST 1]	[ST 1]		
	11.13	Observe that air flow controller O/P now to "0" psi when indicated air flow is above boiler demand stack not clear proceed to 1.3.2.2.1.1	1.3.2.2.9.1	Sys. oper.	1.3.2.2.9.1	
	11.14	Return control to operator				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	12	Check FDB A/M stations				
	13	Corrects fault in FDB A/M stations				
	13.1	Shift FDB A/M stations to remote manual [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	13.2	Shift control of blower associated with faulty FDB A/M station to local manual	Per mot	Location of local man. control of blower	Given an operating blower control, shift control from remote manual to local manual in 3 min. W/O procedural error	
	13.3	Shut aur supply to faulty FDB A/N sta.		(Valve under console)	Given an operating console with indications of faulty A/M station, isolate & remove the compensating relay in 5 min. with no procedural errors	
	13.4	Disconnect & remove compensating relay	Mot-use hand tools to disconnect & remove comp. relay	Location of comp. relay in A/M sta. under console	Given an operating console with indications of faulty A/M stationm isolate & remove the compensating relay in 5 min. with no procedural errors	
	13.5	[Insert Rep. & calib.]	[ ]	[ ]	[ ]	
	13.6	Reinstall & reconnect comp. relay	Mot use hand tools to reinstall & reconn.	Location	Given a repaired & recalibrated compensating relay, reinstall & reconnect in A/M station & deisolate in 5 min. W/O procedural error	
	13.6	Shift control of affected blower to remote manual			Given an operating blower counted, shift control from local manual to remote manual in 3 min. w/o procedural error	
	13.7	Shift FDB A/M sta. to auto [ST 1]	[ST 1]	[ST 1]	[ST 1]	
		Stack not clear proceed to 1.3.2.2.5				
	13.8	Return control to operator				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	14	Check down stream air loop				
	14.1	Vary FDBA/MSTA O/P and observe that blowers respond throughout range	Per mot - vary A/M sta. O/P while observing blower tachs. (Tachs on console)	Smooth response of flowers indicate down stream air loop functioning properly and not source of trouble	Given a display indicating blower response, determines that fault is not in down stream air loop in 1 min.	
	14.2	Vary FDB A/M sta. output and observe that blowers do not respond smoothly throughout range	Per mot vary A/M sta. output while observing blower tachs.	Eratic reaponae of blowers indicates trouble is located in downatream air loop (range mod-under conaole)	Given a display indicating eratic blower response determines that fault is located in downstream air loop in 1 min.	
	15	Check range modifier				
	15.1	Check that range modifier O/P corresponds to FDB A/M sta. O/P according to calib. table data proceed to 1.3.2.2.6	Per test ret. compare O/P's from range modifier & FDB A/M sta. with data taken from calib. table	Location of indications location of calib. data (gages under conaole) (data in tech. manual)	Given a display indicating range modifier O/P and FDB A/M sta. O/P correspond and a calib. table, determine by comparison that range modifier is not the source of trouble and that FDB governor & emission valve ia the only unit left in down stream loop	
	15.2	Check that range modifier O/P does not correspond to FEB A/M O/P according to calib. data table	Per test ret. compare O/P's from range modifier & FDB A/M sta. with data taken from calib. table	Location of indications location of calib. data (gagea under console) (data in tech. manual)	Given a display indicating range modifier O/P and FDB A/M sta. O/P do not correspond, and a calib-table. Determine by compariosn that range modifier is source of trouble in 1 min.	
	16	Correct fault in range modifier				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	16.1	Shift FDB A/M sta. to remote manual [ST 2]	[ST 2]	[ST 2]		
	16.2	Shift control of affected FDB to local manual	1.3.2.2.4.2	1.3.2.2.4.2	1.3.2.2.4.2	
	16.3	Set affected FDB A/M sta. manual O/P to "O" psi	Per mot adjust chair relay while observing identation			
	16.4	Shut supply air to range modifier	Mot	Location (under console)		
	16.5	Disconnect & remove range modifier	Mot-use hand tools to disconnect & remove	Location (under console)		
	16.6	[Insert Rep & calib.]	[ ]	[ ]		
	16.7	Reinstall & reconnect range modifier	Mot-use hand tools		Given a repaired and recalibrated range modifier, reinstall & reconnect in system and deisolate in 5 min. W/O procedural error	
	16.8	Open supply air to range modifier	Mot	Location		
	16.9	Shift control of affected FDB from local manual to remote manual	Per mot			
	16.10	Shift FDB A/M sta. to auto [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	16.11	Shift FDB master A/M sta. to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	16.12	Observe that range modifier O/P now corresponds to FDB A/M sta. O/P Iaw calib. data table stack not clear proceed to 1.3.2.2.6	Per test ret. compare range mod. & A/M sta. O/P with data table	Location-indicates location data table use of data table	Given a display indicating range modifier O/P and FDB A/M sta. O/P corresponds Isw calib. table determine by comparison that range modifier fault has been correct within 3 min. to 100% accuracy	
	16.13	Return control to oper.				
	17	Check FD blower governor and emission valve				
	17.1	Shift affected FDB A/M sta. to remote manual [ST 2]	Per mot [ST 2]	[ST 2]		
	17.2	Secure affected FDB				This step in the procedure is accomplished by watch stander
	17.3	Shut supply air to affected range modifier		(Under conscle at FDB)		
	17.4	Shut root stm. & exhaust valves to FDB				
	17.5	[Insert calib. & repair]	[ ]	[ ]	[ ]	[ ]
	17.6	Open supply air to range modifier				
	17.7	Open root stm. & exhaust valves to FDB				
	17.8	Start FDB (FDB A/M sta. to remote man.)				
	17.8	[Insert final calib.]	[ ]	[ ]	[ ]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	17.9	Observe that FDB now responds smoothly to varying FDB A/M sta. O/P				Watch stander starte FDB
	17.10	Shift FDB A/M sta. to auto	[ST 1]	[ST 1]		
	17.11	Shift FDB master A/M sta. to auto. stack not clear proceed to 1.3.2.2.7 [ST 4]	[ST 4]	[ST 4]		
	17.12	Return control to oper.				
	18	Check air flow xmtr.				
	18.1	Corrects fault in air flow xmtr.		(A.F xmtr. in space)	Given an operating console into which an eir flwo xmtr. fault has been placed isolete faulty component within 3 mins with no procedural errors.	This T/O is eplit becauee in some cesee the eir flow xmtr. may be repaired in splece using e portable test unit. The insert will make provieion for both portable and fixed test units.
	18.1.1	Shut air supply and sensing lines to air flow transmitter	Mot	Location (at xmtr. space)		
	18.1.2	Disconnect and remove air flow xmtr.	Mot-use hand tools to disconnect and remove	Location of air flow xmtr. under console	Given an operating console in which air flow xmtr. fault has been isolated, remove eir flow xmtr. from system in 5 mins. with no procedural error	
	18.1.3	[Insert cal. & repair]				
	18.1.4	keinstall and reconnect air flow xmtr.	Mot-use hand tools to reinstall and reconnect		Given e repaired end recalibrated air flow xmtr. reinstall end re-connect in system in 5 min. with no procedural errore	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	18.1.5	Open air supply and sensing lines to sir flow xmtr.	Mot	Location		
	18.1.6	Parallel boiler master A/M sta. indicators	Per mot			
	18.1.7	Shift FO A/M to auto. [ST 4]	[ST 4]	[ST 4] Console is now in one knob remote man. control	Given an operating console with air flow xmtr. fault removed determine from conaole front indications, periscope and amoke density meter that system now hca ability to steam with clear stack in 3 min.	
	19	Check excess air adjuster				
	19.1	Disconnect and remove air flow xmtr.	Mot-use hand tools to disconnect and remove	Location of sir flow xmtr. under console	Given an operating conaole in which air flow xmtr. fault has been isolated, remove air flow xmtr. from syatem in 5 mins with no procedural errora.	
	20	Corrects fault in excess air adjust.		(Excess air adjuster under console)	Given an operating conaole into which an excess air adj. fault has been placed. Isolate and remove faulty component in 10 mins. with no procedural errors	
	20.1	Shut air supply to air flow xmtr. and excess air adj.		Locstion (A/F xmtr-spac3 exc. air adj. under console)		
	20.2	Disconnect and remove excess air adjuster	Mot-use hand tools to disconnect and remove	Locstion of excess air adjuster under conaole		
	20.3	Insert calibration and repair				
	20.4	Reinstalls and reconnects excess air adjuster			Given a repaired and recalibrated excess air adjuster reinstall in system in 10 min. with no procedural errors	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	21	Evaluate results of corrective actions	Diag. - observe console indications as unit is put back in service to determine if corrections are successful	Sys. Operation	Given an operating console from which excess air adjuster fault has been removed, determine from console front indications that unit is operating sat.	
	21.1	Open supply air to air flow xmtr. and excess air adjuster		Sys. oper. excess air adjuster output should now be = to air flow xmtr. output		
	21.2	Parallel indicators on boiler master A/M stat.				
		Shift FO A/M sta. to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	21.3	Shift FDB A/M sta. to auto [ST 4]	[ST 4]	[ST 4]	Console is now one kind remote man. control on boiler master A/M sts.	
	21.4	Observe system response in that stack is clear while manipulating system in one knob control	PerMEM - observe console parameters and periscope/ smoke density meter for sat. operation	Sys. operation	Given the operating console with excess air adjuster fault corrected determine from console front indications, periscope and smoke density meter that system now has ability to steam with clear stack in 3 min.	
	21.4.1	Shift boiler master A/M sta/ to auto [ST 1]	[ST 1]	[ST 1]		
	21.4.2	Return control of console to operator				
	21.5	Observe that periscope is not clear	Per-observe periscope and verify with smoke density meter	Appearance of periscope when stack is smoking		
	22	Check low signal selector				

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EVENT	TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	22.1 Determine that FO signal is > air flow signal	Diag. - observe FO demand and air flow signals to determine if trouble is located up stream or down stream of FA A/M sta. (FO A/M on console)	System operation when FO demand signal is > air flow signal trouble is in up stream oil loop and component indicated is low signal selector (low sig. selector-under console)	From an operating console that display AFO demand signal > the air flow signal determine that the trouble is located in the upstream oil loop and that the low signal selector is the indicated component in one minute to 100% accuracy	
	23 Correct fault in how signal selector				
	23.1 Remove low signal selector from system				
	23.1.1 Shift FO A/M sta to manual [ST 3]	[ST 3]	[ST 2]		
	23.1.2 Shift FDB Master A/M sta. to manual	[ST 3]	[ST 3] console is now in two knob remote manual control		
	23.1.3 Shut suppy air to excess air adjuster	MOT	Location of system isolation valves (under console)		
	23.1.4 Shift boiler master A/M sta. to man. [ST 2]	[ST 2]	[ST 2]		
	23.1.5 Decrease boiler master output signal to zero	Per-mot turn comp. relay knob on boiler master sta. in decrease directions while observing gage (boiler master sta. on console)	Location of controls low signal selector input signals are now isolated		
	23.1.6 Disconnect and remove low signal selector	MOT use hand tools to disconnect and remove			In all procedures whiare hand tools are required tools list will ba included with cal. & repair insert

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EVENT	TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	23.1.7 Insert calib. & repair				
	23.1.8 Reinstall and reconnect low signal selector in system			Given a repair and recalibrated low signal selector reinstall in system within 10 min.	
	23.2 Evaluate results of corrective actions	Diag. - observe console indic. as unit is put back in service to determine if corrective actions are successful	Sys. operation	Given an operative console from which low signal selector fault has been removed determine from console front indications that unit is operating satisfactorily	
	23.2.1 Open air supply to excess air adjuster	MOT/MEM	Sys. operation auto indicator on FO A/M station should remain at zero		
	23.2.2 Increase manual output signal on boiler master A/M station to a point above air flow indication	Per-mot/MEM	Sys. oper-auto indication on FO A/M sta. should track with boiler master indication then stop. Even though boiler master indication continues to increase		
	23.2.3 Parallel boiler master indicators	Per-mot			
	23.2.4 Shift FO A/M sta. to auto [ST 4]	[ST 4]	[ST 4]		
	23.2.5 Shift FDB master to A/M sta. to auto. [ST 4]	[ST 4]	[ST 4] console is now in one knob remote man control on boiler master A/M station		

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	24	Check characterizing relay				
	24.1	Observe characterizing relay output to correspond with input with calibration data table proceed to 1.3.1.3.10	Diag. text ret-extracts inputs vs. output data from calibration data table and compare input-output for acceptibility	Location data table: that trouble is located in char relay (char relay mounted under console)	Given a display indicating correct characterizing relay input & output utilizee tech. manual information to compare input with output determine acceptibility of indications within 5 min. 100% eccurate	
	24.2	Observe characterizing relay output does not correspond to input as per data table	Diag. text-ret extracts input vs. output data from calibration data table and compares input-output for acceptibility	Location data table: that trouble is located in char relay (char relay mounted under console)	Given a display indicating incorrect char relay output, utilizes tech. manual information to determine indicatione are not acceptable and that chair relay is the trouble source within 5 min. 100% accurate	
	25	Correct fault in char relay				
	25.1	Correct fault in char. relay				
	25.2	Shift control of FO flow control valve to local manual using hand jack	Per mot use hand jack on FO flow cont. valve to take control and observe FO press. gage to determine when control in local manual is effected	Location of FO flow cont. valve hand jack and local FO press. gage to (valve in space gage on gage board in space)	Given an operating FO flow control valve and indication of normal syetem FO pressure aesume control of FO preaeure in local min. in 3 min. with no procedural errore.	
	25.3	Shut air supply valve to char relay	Mot	Location (under console)	Given an operating coneole into which a chair relay fault hae been placed isolate & remove chair relay in 5 min. with no procedural errors	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.1.3 Low Steam Pressure	25. .	Disconnect & remove char relay	Mot use hand tools to disconnect & remove	Location of char relay under console		
	25.5	[Insert cal. & repair]	[ ]	[	[ ]]	
	25.6	Reinstall & reconnect char relay			Given an operating console and a repaired & recalibrated char relay reinstall & reconnect in system in 5 min. with no procedural errors	
	25.7	Open supply air valve to char relay	Mot	Location	Given a reinatalled & reconnected char relay deisolate and return to service in 3 min.	
	26	Check FO control valve				
	26.1	Observe that FO pressure varies smoothly as FO A/M station output is varied stack not clear proceed to 1.3.1.3.10.2.3.2	Per mot vary FO A/M sta. output while obaerving FO press. gage for acceptibility	Location FO press. gage that smooth movement of FO press. gage indicated FO flow control valve operating properly (gage on console)	Given an operating console with indication of FO pressure moving amoothly and response to FO A/M sta. output determines that FO flow control valve ia not the source of trouble	
	26.2	Observe that FO pressure does not vary smoothly as FO A/M sta. output is varied	Per mot vary FO A/M sta. output hile observing FO press. gage for acceptibility	Location FO press. gage that eratic movement of FO press. gage indicates FO flow control valve not operating properly	Given an operating console with indications of eratic FO press in response to varying FO A/M ata. output determinea that trouble is located in FO flow control valve	
	27	Correct fault in FO control valve				
	27.1	Shift control of FO flow cont. valve to local manual	_____	_____	1.3.1.3.9.2.1	
	27.2	Crack open FO flow control valve by-pass		(By-pass located near F/O control valve-in space)		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.5 Low Steam Pressure	27.3	Shut FO inlet valve to FO flow cont. valve while opening by-pass to assume control of FO press. on by-pa' ;	Mot-close one valve while opening another to maintain a smooth transition of control	(Isolation valves located near F/O control valve in-space)	Given an operating system shift control of FO preasure to the by-pass and isolate FO flow control valve	
	27.4	Shut FO outlet valve				
	27.5	Disconnect & remo e FO flow control valve	Mot use hand tools to disconnect & remove			
	27.6	[Insert repair]	[ ]	[ ]	[ ]	
	27.7	Reinstall & reconnect FO flow control valve	Mot			
	27.8	Open FO flow cont. valve outlet valve				
	27.9	Crack open inlet valve				
	27.10	Shut by-pass valve while opening inlet valve to assume control of FO press. on FO flow control valve in local man.	1.3.1.3.10.2.3			
	27.11	Shift control of FO flow control valve to remote man.	Mot use hand jack to assume control in remote manual			
	27.12	[Insert cal. for min. oil press.]	[ ]	[ ]	[ ]	
	27.13	Shift FO A/M sta. to auto[ST 1] and observe stacks clear	[ST 1]	[ST 1]	[ST 1]	
End of Low Steam Pressure Event						

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	1	Take control of console from operstor				
	1.1	Reproduce event			1.3.3.1.1	
	1.1.1	Shift BLR master A/M, FDB A/M's, & FO A/M to auto.	[ST1/ST 4]	[ST 1/ST 4]		
	1.1.2	Observe BLR steam press. not at desired value	Per	BLR steam press. should be 1275 psi		
	2	Observe demand loop	Diag. per mot	Sys. operation		
	2.1	Observe BLR A/M O/P ↓ to 0 % As steam press.↑ above 1275 psi proceed to 1.3.6.3	Diag. Per mot	System operation boiler A/M O/P should resch 0% as steam press. reaches 1285 psi	Given s display indicsting BLR A/M O/P↓ to 0 % as steam press.↑ above 1275 psi determine thst fault is downstresm of demand loop in 1 min. w/100% sccursсy	
	2.2	Cbserve BLR A/M O/P↓ to 0% as steam press. above 1275 psi	Diag. per mot	1.3.6.2.1 System operation boiler A/M O/P should reach 0% as steam press. reaches 1285 psi	Given a display indicating BLR A/M O/P↓ to 0% as stesm press.↑ above 1275 psi determine that fault is in demand loop in 1 min. w/100% accuracy	
	2.2.1	Observe that BLR A/M O/P trscks I/P proceed to 1.3.6.2.3	Diag.	Sys. Oper.	Given a display indicsting BLR A/M O/P trscks I/P, determine that A/M station is not source of trouble & that problem is located in demand loop upstream of BLR A/M station, in 30 sec. w/100% sccuracy	

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1.3.6 High Steam Pressure	2.2.2 Observe that BLR A/M O/P does not track I/P	Diag.	Sys. oper.	Given a display indicating BLR A/M O/P does not track I/P, determine that A/M station is source of trouble	
	2.2.2.1 Correcta fault in R A/M station High steam press. not corrected proceed to 1.3.6.2.3				
	2.2.2.1.1 Reproduces event				
	2.2.2.1.1.1 Shift FO A/M to auto	Per mot	[ST 4]	[ST 4]	
	2.2.2.1.1.2 Shift FDB maater A/M to auto [ST 4]	Per mot	[ST 4]	[ST 4]	
	2.2.2.1.1.3 Shift boiler master A/M to auto [ST 1]	Per mot	[ST 1]	[ST 1]	
	2.2.2.1.1.4 Observe ↓ stm. press.	Per.			
	2.2.2.1.2 Make observations on console				
	2.2.2.1.2.1 Observe boiler maater A/M O/P ↑ W/zero bias to 100% as stm. press ↓ below 1275 psi	Diag.	Sys. oper. that boiler master A/M should reach 100% aa stm. press ↓ to 1265 psi (stm. press gage on consale)	Given an operating consale indicating a decreasing stm. press. determines from display that boiler master O/P to 100% as stm. press ↓ below 1275 psi indicating that demand loop is not the source of trouble 30 sec. 100%	
	2.2.2.1.2.2 Observe boiler master A/M O/P ↑ to 100% as stm. press ↓ below 1275 psi	Diag.	Sys. oper. that boiler master A/M should reach 100% as stm. press. ↓ to 1265 psi (stm. press. gage on consale)	Given an operating consale indicating a decreasing stm press. determine from the display that boiler master O/P ↑ to 100% as stm. press ↓ below 1275 psi indicates that trouble is located in demand loop in 30 sec. 100%	

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EVENT	TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	2.2.2.1,2.2.1 Observe that boiler master A/M O/P tracks I/P proceed to 1.3.5.4	Diag.	Sys. oper.	Given a display indicating boiler master A/M O/P ↑ = I/P ↑ determines that A/M station is not source of trouble and that problem is located in upstream demand loop in 30 sec. 100%	
	2.2.2.1.2.2.2 Observe boiler master A/M O/P does not track I/P	Diag.	Sys. oper.	Given a display indicating boiler master A/M O/P ≠ I/P determines that boiler master A/M station is source of trouble in 30 sec. 100%	
	2.2.2.1.3 Correct fault in boiler master A/M station			Given a boiler master A/M sts. in which a fault has been plsced isolate, disconnect & remove the comp. relay in 5 min. w/o error	
	2.2.2.1.3.1 Shift boiler master A/M to manual [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	2.3 Observe that inverting relay O/P ↓ to 0 psi as high signal selector O/P ↑ to 60 psi proceed to 1.3.6.2.5	Diag.	Sys. oper. location of gages under console	Given a display indicating a properly operating inverting relay is not cause of trouble & problem is upstream of inv. relay in 1 min. w/100% accuracy	
	2.4 Observe that inverting realy O/P ↓ to 0 psi as high signal selector O/P ↑ to 60 psi	Diag.	Sys. oper., location of gages, under console	Given a display indicating a fauly inverting relay determine that inv. relay is cause of trouble in 1 min. w/100% accuracy	
	2.4.1 Correct fault in inverting relay				
	2.4.1.1 Shift boiler A/M to remote manual [ST 1]	[ST 1]	[ST 1]	Given a display indicating inverting relay O/P ≠ 60 psi - O/P of high signal selector determines that inverting relay is not	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
					source or trouble & that problem is located upstream of inverting relay in 1 min. 100%	
1.3.6 High Steam Pressure	2.4.1.2	Shut suppy air valve to inverting relay	Mot	Location of valve (under console)		
	2.4.1.3	Shut supply air valve to "A" & "B" steam pressure controllers	Mot	Location of valves (in space at controllers)		
	2.4.1.4	Disconnect & remove inverting relay	Mot-use hand tools to disconnect & remove	Location of invert. relay under console		
	2.4.1.5	[Insert repair & calib.]	Mot	[ ]	[ ]	
	2.4.1.6	Reinstall & reconnect inverting relay	Mot		Given a repaired & recalib. inverting relay, reinstall, reconnect in system & deisolate	
	2.4.1.7	Open supply air valve to inverting relay	Mot	Location		
	2.4.1.8	Open supply air valve to "A" & "B" stm. press. controllers	Mot	Location		
	2.4.1.9	Observe that inverting relay O/P now = 60 psi -O/P of high signal selector			[1.3.5.4.1]	
	2.4.1.10	Shift boiler master A/M to auto. [ST 1]	[ST 1]	[ST 1]	[ST 1]	
	2.4.1.11	Return control to oper.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTICE	COMMENTS
1.3.6 High Steam Pressure	2.5	Observe that high signal selector O/P = highest O/P from steam press. controllers	Diag.	Sys. oper. locat. of gagen	Given a display indicating a properly operating high signal selector, determine that fault is not in high signal selector in 1 min. w/100% accuracy	
	2.6	Observe that high signal selector O/P ≠ highest O/P from steam press. controller	Diag.	Sys. oper.	Given a display indicating a faulty high-signal selector determine fault in 1 min. w/100% accuracy	
	2.6.1	Correct fault in high signal selector				
	2.6.1.1	Shift boiler master A/M stations to manual	[ST 2]	[ST 2]	[ST 2]	Operator do
	2.6.1.2	Shut supply air to both steam pressure controllers	Mot	Location-in space	Given a high-signal selector into which a fault has been placed, isolate, disconnect, & remove in 5 min. w/o procedural error	
	2.6.1.3	Disconnect & remove high-signal selector	Mot-using hand tools to disconnect & remove	Location under console		
	2.6.1.4	[Insert repair & calib]	[ ]	[ ]	[ ]	
	2.6.1.5	Install & reconnect high-signal selector	Mot-use of hand tools	Location	Given a high-signal selector into which a fault has been repaired, install, reconnect, & deisolate in 5 min. w/o procedural error	
	2.6.1.6	Open supply air to steam pressure controllers	Mot	Location		
	2.6.1.7	Shift boiler master A/M stations to auto.	[ST 1]	[ST 1]	[ST 1]	Operator do

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	2.6.1.8	Return control to operating personnel Fault not corrected proceed to 1.3.6.2.7				
	2.7	Observe that O/P of steam pressure controller does not ↑ to 60 psi as steam press. ↑ above 1275 psi	Diag. per mot	System operation applies only to E/P cont. on boilers in operation	Given a dieplay indiceting a faulty steam preesure controller, determine faulty component in 1 min. w/100% accuracy	
	2.7.1	Correct fault in steam pressure controller Fault not corrected proceed to 1.3.6.3				
	2.7.1.1	Correct fault in stm. press. controller				
	2.7.1.1	Shift boiler master A/M to remote manual [ST 2]	[ST 2]	[ST 2]	Given a steam pressure controller in which a fault has been placed, isolate, blow down disconnect & remove from system, in 5 min. w/o error	
	2.7.1.2	Shut supply air valve to affected stm. press. controller	Mot	Location of valve (at controller)		
	2.7.1.3	Shut steam press. sensing to steam press. controller	Mot	Location		
	2.7.1.4	Shut steam press. sensing line isolation valve at stm. press controller		Location		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	2.7.1.5	Open sensing line drain valve		Personnel must be clear of vent while blowing down		
	2.7.1.6	Disconnect & remove stm. pressure cont.	Mot			
	2.7.1.7	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	2.7.1.8	Reinstall & reconnect stm. pressure controller	Mot		Given a repaired & recalib. stm. pressure controller reinstall	
	2.7.1.9	Shut sensing line drain valve	Mot			
	2.7.1.10	Open Sensing Line	Mot	Permit condensate to form in line until line is warm to touch		
	2.7.1.11	Open supply air valve to steam pressure controller	Mot	Location		
	3	Observe fuel loop	Diag. per mot	Sys. oper.		
	3.1	Observe that FO A/M O/P ↓ to 0% as boiler A/M O/P ↓ to 0% proceed to 1.3.6.3.3	Diag. per mot	Sys. oper.	Given a display in which FO A/M O/P ↓ to 0 % as B/R master A/M O/P ↓ to 0% determine that low signal selector is not cause of trouble & fault is located downstream of FO A/M station in 1 min w/100% accuracy	
	3.2	Observe that FO A/M O/P ↓ to 0% as B/R master A/M O/P ↓ to 0%	Diag. per mot	Sys. oper.	Given a display indicating a faulty lo-sig. selector determine faulty component in 1 min w/100% accuracy	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	3.2.1	Correct fault in lo-sig. selector				
		Fault not corrected proceed to 1.3.6.3.3				
	3.2.1.1	Remove low signal selector from system				
	3.2.1.1.1	Shift FO A/M sta. to manual [ST 3]	[ST 3]	[ST 3]		
	3.2.1.1.2	Shift FDB Master A/M sta. to manual [ST 3]	[ST 3]	[ST 3] Console is now in two knob remote manual control		
	3.2.1.1.3	Shut supply air to excess air adjuster	Mot	Location of system isolation valves (under console)		
	3.2.1.1.4	Shift boiler master A/M sta. to man. [ST 2]	[ST 2]	[ST 2]		
	3.2.1.1.5	Decrease boiler master output signal to zero	Per-mot turn comp. relay knob on boiler master sta. in decrease directions while observing gage. (boiler master sta. on console)	Location of control low controls low signal selector input signals are now isolated		
	3.2.1.1.6	Disconnect & remove low signal selector	Mot use hand tools to disconnect and remove			In all procedures where hand tools are required tools list will be included with cal. & repair insert

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	3.2.1.1.7	[Insert calib. & repair]				
	3.2.1.1.8	Reinstall and re-connect low signal selector in system			Given a repair and recalibrated low signal selector reinstall in syatem within 10 min.	
	3.3	Observe that characterizing relay O/P ↓ to min. aa FO A/M O/P ↓ to 0% proceed to 1.3.6.3.5	Diag. per mot text ret.	Location of charact. relay calib. data	Given a diaplay in which charact. relay O/P to min. determine that charact. relay is not cauae of trouble & fault ia in FO control valve	
	3.4	Observe that charact. relay O/P ↓ to min. as FO A/M O/P ↓ to 0%	1.3.6.3.3 Diag. per mot	1.3.6.3.3 Location of charact. relay calib. data	Given a display indicating faulty charact. relay determine faulty component in 1 min w/100% accuracy	
	3.4.1	Correct fault in characterizing relay Fault not corrected proceed to 1.3.6.3.5	1.3.1.3.9 thru 1.3.1.3.9.2.8	1.3.1.3.9 thru 1.3.1.3.9.2.9	1.3.1.3.9 thru 1.3.1.3.9.2.8	
	3.4.1.1	Observe characterizing relay output to correspond with input with calibration data table proceed to 1.3.1.3.10	Diag, text ret-extracts input vs. output data from calibration data table and compares input-output for acceptibility	Location of data table in navy ships tech. manual: that trouble is located downstream of chair relay (FO A/M on console & relay O/P chair under console	Given a display indicating correct characterizing relay input & output utilizes tech. manual information to compare input with output to determine acceptibility of indications within 5 min. 100% accurate	
	3.4.1.2	Observe characterizing relay output does not correspond to input as per data table	Diag. text-ret extracts input vs. output data from calibration data table and compares input-output for acceptibility	Location data table: that trouble is located in chair relay (chair relay mounted under console)	Given a displsv indicating incorrect chair relay output, utilizes tech. manual information to determine indications are not acceptable and that chair relay is the trouble source within 5 min. 100% accuracy	

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EVENT	TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	3.4.1.2.1 Correct fault in char. releay				
	3.4.1.2.2 Shift control of FO flow control valve to local manual using hand jeck	Per mot use hand jack on FO flow control valve to take control and observe FO press. gage to determine when control in local manual is effected	Location of FO flow cont. valve hand jack and local FO press. gage to (valve in space gage on gage board in space)	Given an operating FO flow control valve and indicetion of normal system FO pressure assume control of FO pressure in local min. in 3 min. with no procedural errors.	
	3.4.1.2.3 Shut air supply valve to chair relay	Mot	Location (under console)	Given an oeprating console into which a chair relay fault has been placed isolate & remove chair relay in 5 min. with no procedurel errors	
	3.4.1.2.4 Disconnect & remove chair relay	Mot use hand tools to disconnect & remove	Location of chair relay under console		
	3.4.1.2.5 [Insert cal. & repair]	[ ]	[ ]	[ ]	
	3.4.1.2.6 Relnstall & reconnect chair relay			Given sn opersting console and a repaired & recalibrated chair relay reinstell & reconnect in system in 5 min. with no procedural errors	
	3.4.1.2.7 Open supply air valve to chair relay	Mot	Location	Given a reinstalled & reconnected chair relay deisolate and return to service in 3 min.	
	3.4.1.2.8 Shift control of FO flow control valve to remote manual	Per mot use hand jack on FO flow control valve to return control to remote manual	Location FO flow cont. val. & local FO press. gage.	Given an operating FO flow control valve and indications of normal FO system press effect remote manual control in 3 min. with no procedural errors	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure			observe FO press gage to determine when remote manual control is effected			
	3.5	Observe that FO press. ↓ to min. as FO A/M O/P ↓ to 0 %	Diag. per mot	Sys. oper. min of pressure	Given a display indicating a faulty FO control valve determine faulty component in 1 min. w/100% accuracy	
	3.5.1	Shift control of FO flow cont. valve to local manual	_____	_____	1.3.1.3.9.2.1	
	3.5.2	Crack open FO flow control valve by-pass		(By-pass located near FO control valve-in space)		
	3.5.3	Shut FO inlet valve to FO flow cont. valve while opening by-pass to assume control of FO press. on by-psss	Mot-close one valve while opening another to maintain a smooth transition of control	(Isolation valves located near F/O control valve in-spsce)	Given an operating system shift control of FO pressure to the by-pass snd isolate FO flow control valve	
	3.5.4	Shut FO outlet vslve				
	3.5.5	Disconnect & remove FO flow control val.	Mot use hand tools to disconnect & remove			
	3.5.6	[Insert repair]	[ ]	[ ]	[ ]	
	3.5.7	Reinstall & reconnect FO flow control valve	Mot			
	3.5.8	Open FO flow cont. valve outlet valve				
	3.5.9	Crack open inlet val.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.6 High Steam Pressure	3.5.10	Shut by-pass valve while opening inlet valve to assume control of FO pressure on FO flow control valve in local manual	1.3.1.3.10.2.3			
	3.5.11	Shift control of FO flow control valve to remote man.	Not use hand jack to assume control in remote man			
	3.5.12	Insert cal. for min. oi press.				
	3.5.13	Shift FO A/M sta. to auto [ST 1] and observe stacks clear	[ST 1]	[ST 1]	[ST1]	
End of high steam pressure event	3.5.14	Return control to operator				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Excess Feed Press 1.3.7	1	Take control of console from operator				
	1.1	Reproduces event			[1.3.3.1.1]	
	1.1.1	Shift main feed A/M to auto	[ST 1]	[ST 1]	[ST 1]	
	1.1.2	Observe main feed pressure not at desired valve	Per	Main feed press. carried↑75 psi above steam press.		
	1.1.3	Observe that MFP speed varies as main feed A/M O/P varies proceed to 1.3.7.3.1	Diag.-Per mot	Sys. operation	Given a display that indicates main feed pump speed does not vary as main feed A/M O/P varies determines that malfunction is located in MFP control system upstream of pneumatic hydralic controller	
	1.1.4	Observe that MFP speed does not vary as main feed A/M O/P varies			Given a display that indicates main feed pump speed does not vary as main feed A/M O/P varies determines that trouble is in pnuematic hydralic controller 30 sec. 100%	
	2	Correct fault in pnuematic hydralic controller				
	2.	Shift main feed A/M to remote manual	[ST 2]	[ST 2]	[ST 2]	
	2 2	Shift control of main feed pump to local manual	Per-motor, observe feed pressure gage on MFP while taking control of govenor by hand			This step done by watch stander

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.2.2.1	Shift main feed A/M to auto.	[ST 2/ST 3]	[ST 2/ST 3]	Given a feed header pressure controller into which a fault has been placed, isolate, diaconnect & remove from the system the feed hesder pressure controller in 10 min. w/o error	
	3.2.2.2	Shut supply air valve to feed header pressure controller	Mot	Location of valve in feed control panel		
	3.2.2.3	Shut supply air valve set point controller	Mot	Location of valve in feed pump control panel		
	3.2.2.4	Shut fed pressure sensing line valve to feed header pressure controller	Mot	Location of valve in feed system		
	3.2.2.5	Open sensing line drain to bilges to relieve pressure & blow line clear	Mot	Personnel must be clear of drain line		
	3.2.2.6	Shut sensing line isolation valve	Mot	Location of valve no feed header pressure controller		
	3.2.2.7	Disconnect & remove feed header pressure controller	Mot use hand tools to disconnect & remove			
	3.2.2.8	[Insert repair & recalib.]	[ ]	[ ]	[ ]	
	3.2.2.9	Reinstall & reconnect feed leader pressure controller	Mot		Given s feed header pressure controller in which a fault has been corrected, reinstall reconnect, & deisolate in 15 min. w/o error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.2.2.10	Shut sensing line drain valve	Mot			
	3.2.2.11	Open sensing line	Mot	Permit condensate to form in line until line is warm to touch		
	3.2.2.12	Open sensing line isolation valve at feed header pressure controller	Mot	Location		
	3.2.2.13	Open supply air valves to feed header press. & set point controller	Mot	Location		
	3.2.2.14	Shift MFP A/M's to auto.	[ST 2/ST 4]	[ST 2/ST 4]		
	3.2.2.15	Observe proper operation of system & return control to operating personnel	Diag.	Sys. operation	[1.3.7.3.3]	
	2.3	Start stby. pump				
	2.4	Secure affected main feed pump				
	2.5	Shut inlet isolation valve to stem emission valve	Mot	Location of isolation valve on main feed pump	Given a pnuematic hyd. controller in which a fault has been placed isolate, disconnect & remove from system in 15 min. W/o error	
	2.6	Disconnect and remove the pneumatic hyd. controlled stm. emission valve				
	2.7	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	2.8	Reinstall & reconnect pneu. hyd. controller			Given a pneu/hyd. controller in which a fault has been corrected reinstall, reconnect in system and deisolation in 15 min. w/o error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	2.9	Open supply air valve to main feed A/M sta.		Location of supply air valve under console		
	2.10	Notify top watch that repairs are completed & MFP may be used				
	2.11	Observe that MFP speed varies as main feed A/M O/P varies Excess feed pressure condition still exists proceed to 1.3.7.3.1	Diag.	Location of gages on console	[1.3.7.1.1.3] This step carried out whenever affected MFP is placed back in service	
	2.12	Return control to oper.				
	3	Check MFP control sys. upstream				
	3.1	Observe that main feed press is maintained at 1500 psi or a $\Delta p > 75$ psi Proceed to 1.3.7.3.5	Diag.-observe ΔP on main-stream gage & main feed header press. gage on console	Sys. oper.	Given a display indicating main feed header pressure @ 1500 psi or A P 75 psi determines that trouble is located in one of the following components - P xmtr., feed header pressure controller, or set point controlle in 1 min. 100%	
	3.2	Observe that MF A/M O/P $\not\downarrow$ as main feed press varies.	Diag-observe main feed A/M manual indicatior & main feed header press gage	Sys. oper.	Given a display indicating a MF A/M O/P $\not\downarrow$ as main feed pressure varies. Determines from the display that trouble is located in one of the following components-mainfeed A/M, range modifier or feed header pressure controller, in 1 min. 100%	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.3	Observe that feed header pressure controller O/P ↑ as main feed header pressure ↑ proceed to 1.3.7.3.4.2	Diag. compare feed header press controller O/P on feed control pannel with feed header pressure on console	Sys. oper.	Given a display indicating feed header pressure controller O/P as main feed header press. determines that trouble is located in range modifier or main feed A/ M in 30 sec. 100%	
	3.4	Observe that feed header pressure controller O/P ↑ as main feed header pressure ↑	Diag.-compare feed header press. controller O/P on feed control pannel with feed header pressure gage on console	Sys. Oper.	Given a display indicating feed header pressure controller O/P ↑ as main feed header pressure ↑ determines that trouble is faulty feed header pressure controller in 30 sec. 100%	
	3.4.1	Correct fault in feed header pressure controller				
	3.4.1.1	Shift main feed A/M to auto.	[ST 2/ST 3]	[ST 2/ST 3]	Given a feed header pressure controller into which a fau't has been placed, isolate, disconnect & remove from the system the feed header pressure controller in 10 min. w/o error	
	3.4.1.2	Shut supply air valve to feed header pressure controller	Mot	Location of valve in feed control pannel		
	3.4.1.3	Shut supply air valve to set point controller	Mot	Location of valve in feed pump control pannel		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.4.1.4	Shut feed pressure sensing line valve to feed header pressure controller	Mot	Location of valve in feed system		
	3.4.1.5	Open sensing line drain to bilges to relieve pressure & blow line clear	Mot	Personnel must be clear of drain line		
	3.4.1.6	Shut sensing line isolation valve	Mot	Location of valve no feed header pressure controller		
	3.4.1.7	Disconnet & remove feed header pressure controller	Mot use hand tool to disconnect & remove			
	3.4.1.8	[Insert repair & recall]	[ ]	[ ]	[ ]	
	3.4.1.9	Reinstall & reconnect feed leader pressure controller	Mot		Given a feed header pressure controller in which a fault has been corrected, reinstall reconnect, & deisolate in 15 min. w/o error	
	3.4.1.10	Shut sensing line drain valve	Mot			
	3.4.1.11	Open sensing line	Mot	Permit condensate to form in line until line is warm to touch		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.4.1.12	Open sensing line isolation valve at feed header pressure controller	Mot	Location		
	3.4.1.13	Open supply air valves to feed header press. & set point controller	Mot	Location		
	3.4.1.14	Shift MFP A/M's to auto.	[ST 1/ST 4]	[ST 1/ST 4]		
	3.4.1.15	Observe proper operation of system & return contro trol to operating personnel	Diag.	Sys. operation	[1.3.7.3.3]	
	3.4.2	Observe that range modifier O/P ↑ from 15 psi to 47.8 psi as feed header pressure controller O/P from 0 psi to 60 psi proceed to 1.3.7.3.4.4	Diag. compare range mod. O/P under feed control panel w/ FHPC, O/P under feed control panel	Sys. Operation	Given a display indicating range mod. O/P ↑ in relation to FHPC O/P ↑ determines that trouble is located in main feed A/M in 30 sec. W/100% accuracy	
	3.4.3	Observe that range modifier O/P ↑ from 15 psi to 47.8 psi ss feed header pressure controller O/P ↑ from 0 psi to 60 psi	Diag. compare range modifier O/P under feed control panel W/FHPC O/P under feed control panel	Sys. operation	Given a display indicating range modifier O/P ↑ as FHPC O/P ↑ determine that trouble is faulty range modifier in 30 sec. W/100% accuracy	
	3.4.3.1	Shift main feed A/M'a to manual	[ST 2/ST 3]	[ST 2/ST 3]		
	3.4.3.2	Shut supply air valves to range modifier & feed header pressure controller	Mot	Location if valves in feed control panel	Given a range modifier into which a fault has been placed isolate, disonnect, & remove from the system the range modifier in 10 min w/o error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.4.3.3	Disconnect & remove range modifier	Mot-use hand tools to disconnect & remove	Location		
	3.4.3.4	[Insert repair & calib.]				
	3.4.3.5	Reinstall & reconnect range modifier	Mot		Given a range modifier in which a feult has been corrected, install, reconnect & deieolate in 10 min. w/o error	
	3.4.3.6	Open supply air valves to range modifier & feed heeder pressure controller	Mot	Locetion-valves under feed control panel		
	3.4.3.7	Shift main feed A/M's to auto.	[ST 1/ST 4]	[ST 1/ST 4]		
	3.4.3.8	Observe that renge modifier O/P corres-ponds to feed header preesure controller O/P IAW calibration dats	Per text ret. renge mod O/P sat LW calib. deta	Location of calib. data	[1.3.7.3.4.2] pg.	
	3.4.3.9	Return control to oper.				
	3.4.4	Observe that MFP A/M O/P does not track with I/P on auto on 4-way A/M stations	Diag. compere O/P w/ I/P	Sys. oper.	Given a MFP A/M station display indicating O/P ≠ I/P determine that A/M is not opersting properly	
	3.4.4.1	Shift MFP A/M's to man.	[ST 2/ST 3]	[ST 2/ST 3]		
	3.4.4.2	Shift control of effected MFP to local manual	Per mot	Location of local manual control on MFP procedure	Given an opereting MFF control shift from remote manual to local manual in 3 min. w/o procedural error	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.4.4.3	Shut supply air to affected MFP A/M		Location-valve Under conaole	Given an operating console w/ indications of faulty A/M station, isolate & remove comp. relay in 5 min. w/o procedural error	
	3.4.4.4	Disconnect & remove compensating relay	Mot-use of hand tools to disconnect & remove comp. relay	Location-comp. relay in MFP control panel		
	3.4.4.5	[Insert calib. & repair]	[ ]	[ ]	[ ]	
	3.4.4.6	Reinstall & reconnect comp. relay	Mot-use of hand tools	Location	Given a repaired & recalibrated comp. relay, reinatall & reconnect in A/M station, & deiaolate in 5 min w/o procedural error	
	3.4.4.7	Open aupply air to MF: A/M				
	3.4.4.8	Shift control of affected MFP to remote manual	Per mot	Procedure to shift MFP to remote man. [ST 1/ST 4]	Given an opersting MFP A/M, shift control from local manual to auto in 3 min. w/o procedural error	
	3.4.4.9	Shift MFP A/M's to auto.	[ST 1/ST4]			
	3.4.4.10	Return control to oper.				
	3.5	Observe that I/P to set point controller is proportional to ΔP between MF pressure & boiler preasure according to calib. data proceed to 1.3.7.3.7	Diag, compare MF press. to boiler press. textret.	Location of gages calib, data	Given a display indicating I/P to set point controller is proportional to Δ P determine that Δ P xmtr's are operating properly in 1 min w/100% accuracy	
	3.6	Observe that I/P to set point controller is not proportional to ΔP between MF press. & boiler press. according to calib. data	1.3.7.3.5	1.3.7.3.5	Given a display indicating I/P to set point controller is not proportional to ΔP between MF, pressure & boiler pressure, determine that ΔP xmtrs are operating improperly in 1 min. w/100% accuracy	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.6.1	Identify affected ΔP xmtr.	Per. O/P from ΔP xmtrs = indicate "B" b/r ΔP xmtr. faulty, O/P ≠ indicates "A" b/r ΔP xmtr. faulty	Sys. oper.	Given a display indicating 2 ΔP xmtrs connected in series, identify faulty ΔP xmtr. in 1 min w/ 100% accuracy	
	3.6.11	Shift MFP A/M's to remote manual	[ST 2/ST 3]	[ST 2/ST 3]	[ST 2/ST 3]	
	3.6.1.2	Shut supply air to P xmtrs.	Mot	Location of valve	Given a ΔP xmtr into which a fault has been placed, isolate & remove from system in 10 min w/o procedural errors	
	3.6.1.3	Shift HP & LP isolation valves to affected ΔP xmtr.	Mot	Location of valves		
	3.6.1.4	Disconnect & remove ΔP xmtr.	Mot-use of hand tools to disconnect & remove	Location under MFP control panel		
	3.6.1.5	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	3.6.1.6	Install & reconnect ΔP xmtr.	Mot-use of hand tools to reinstall		Given a ΔP xmtr in which a fault has been repaired, reinstall, & deisolate in 10 min. w/o procedural error	
	3.6.1.7	Open HF & LR isolation valves to ΔP xmtr.	Mot	Location		
	3.6.1.8	Open supply air to ΔP xmtrs.	Mot	Location		
	3.6.1.9	Shift MFP A/M's to auto.	[ST 1/ST 4]	[ST 1/ST 4]	[ST 1/ST 4]	
	3.6.1.10	Return control to oper. personnel				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.7	Observe that set point controller O/P is steady w/ 30 psi I/P from ΔP xmtrs. Proceed to 1.3.7.3.9	Diag.-compare set point controller I/P & O/P gages	Location of gages in MFP control panel	Given a display indicating a properly operating set point controller determine that fault is in feed pressure controller in 1 min. w/ 100% accuracy	
	3.8	Observe that set point controller is not stable at some value w/ 30 psi I/P from ΔP xmtrs.	1.3.7.3.7 Diag.-compare set point controller I/P & O/P gages	1.3.7.3.7 Location of gages in MFP control panel	Given a display indicating a faulty set point controller determine that component is faulty in 1 min w/100% accuracy	
	3.8.1	Shift MFP A/M's to man.	[ST 2/ST 3]	[ST 2/ST 3]	[ST 2/ST 3]	
	3.8.2	Close supply air to ΔP xmtrs. & set point controller	Mot	Location of valves	Given a set point cont. in which a fault has been placed, isolate & remove from system in 10 min. w/no procedural error	
	3.8.3	Disconnect & remove set point controller	Mot use of hand tools	Location under MFP control panel		
	3.8.4	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	3.8.5	Inatall & reconnect set point controller	Mot-use of hand tools		Given a set point controller in which a fault has been repaired install & deisolate in 10 min. w/no procedural errors	
	3.8.6	Open supply air to set point controller & P xmtrs.	Mot	Location of valves		
	3.8.7	Shift MFP A/M's to auto.	[ST 1/ST 4]	[ST 1/ST 4]	[ST 1/ST 4]	
	3.8.8	Return control to operating personnel				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.7 Excess Feed Press	3.9	Observe that feed header pressure controller does not respond properly to O/P of set point controller	Diag.	System operation relation	Given a feed header pressure controller in which a faulty set point belongs has been placed, determine fault in 3 min. w/100% accuracy	
End of Excess Feed						

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess supar-heat outlet temperatura	1	Observes event-comp. sys. in auto S/H outlet temp.➔950 F	Diag. per mot text ref	System operation location of calib. data		Excass air to oil causas hi S/H outlat temp.
	2	Observe air loop				
	2.1	Observe propar setting of excass air adj. proceed to _____	Diag.	Propar setting= 50% for overload sprayer platas 56-60% for full powar sprayar platas	Given a display indicating propar setting of excass air adj. determine that troubla is not in excass air adj. in 30 sec w/100% accuracy	
	2.2	Observe improper setting of excess air adj.	Diag.	1.3.8.2.1 Proper setting= 50% for overload sprayer plates 56-60% for full power sprayer platas	Given a display indicating incorrect setting of excass air adj. determine that excess air adj. is cause of trouble in 30 sec. w/100% accuracy	
	2.2.1	Adjust setting of excess air adjuster	Per mot	1.3.8.2.1 Propar setting= 50% for overload sprayer plates 56-60% for full power sprayer plates	Given a display indicating incorrect setting of excess air adj. set. at corract setting in 1 min w/100% accuracy	
	2.3	Obsarve excass air adj. O/P = I/P w/ 50% setting procsad to 1.3.8.2.5	Diag.	Sys. oper. location	Given a display indicating a correctly operating excass air adj. determine that excess air adj. is not causa of trouble, & fault is in A/F xmtr. or fuel loop in 1 min. w/100% accuracy	
	2.4	Obsarve excess air adj. O/P ≠ I/P w/50% setting	Diag.	Sys. oper. location	Given a display indicating a faulty excass air adj. determine that excass air adj. is cause of trouble in 1 min. w/100% accuracy	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 cont. Excess Suoer-Heat Outlet Temperature	2.4.1	Correct fault in excess air adjuster/ Fault not not corrected pro. 1.3.8.2.5	1.3.1.3.2.3.1 thru 1.3.1.3.2.4.4.2	1.3.1.3.2.3.1 thru 1.3.1.3.2.4.4.2	1.3.1.3.2.3.1 thru 1.3.1.3.2.4.4.2	
	2.4.1.1	Shut air supply to air flow xmtr. and excess air adjuster		Location (A/F xmtr.-space exc. air adj. under console)		
	2.4.1.2	Disconnect and remove excess air adjuster	Mot-use hand tools to disconnect and remove	Location of excess air adjuster under console		
	2.4.1.3	Insert calibration and reapir				
	2.4.1.4	Reinstalls and re-connects excess air adjuster			Given a repaired and recalibrated excess air adjuster reinstall in system in 10 min. with no procedural errors.	
	2.4.2	Evaluates results of corrective actions	Diag. - observe console indications as unit is put back in service to determine if corrections are successful	Sys. operation	Given an operating console from which excess air adjuster fault has been removed, determine from console front indications that unit is operating sat.	
	2.4.2.1	Open supply air to air flow xmtr. and excess air adjuster		Sys. operation excess air adjuster output should now be = to air flow xmtr. output		
	2.4.2.2	Parallel indicators on boiler master A/M stat.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess Super-heat Outlet Temperature		Shift FO A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	2.4.2.3	Shift FD3 A/M sta. to auto. [ST 4]	[ST 4]	[ST 4]	Console is now one kind remote man. control on boiler master A/M sta.	
	2.4.2.4	Observe system response in that stack is clear while manipulating syst in one knob con rol	Per MEM - observe console parameters and periscope/smoke density meter for sat. operation	Sys. operation	Given the operating console with excess air sdjuster fault corrected determine from console front indications, periscope and smoke density meter that system now hss ability to steam with clear stack in 3 min.	
	2.4.2.4 1	Shift boiler master A/M sta. to auto [ST 1]	[ST 1]	[ST 1]		
	2.4.2.4.2	Return control of console to operator				
	2.5	Observe A/F xmtr to be in calibration proceed to 1.3.8.3	Diag. Text ret.	Location of calib. data formula = $D/P = \frac{o/0^2 \times \max D/P}{100}$	Given a display indicating a properly calibrated A/F xmtr determine that fault is in oil loop in 5 min w/100% accuracy	
	2.6	Observe A/F xmtr not to be in calibration	1.3.8.2.5 Diag. text ret	1.3.8.2.5 Location of calib. data formula = $D/P = \frac{o/0^2 \times \max D/P}{100}$	Given a display indicating an A/F xmtr. out of calib. determine faulty component in 5 min. w/100% accuracy	
	2.6.1	Shut air supply and sensing lines to air flow transmitter Fault not corrected proceed to 1.3.8.3	Mot	Location (s* xmtr.-space)		
	2.6.2	Disconnect and remove air flow xmtr.	Mot-use hard tools to disconnect and remove	Location of air flow xmtr. under console	Given an opersting console in which an air flow xmtr. fsult has been isolated. remove air flow xmtr. from system in 5 mins. with no procedural errors.	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess Super-heat Outlet Temperature	2.6.3	[Insert cal. and repair]	[ ]	[ ]	[ ]	
	2.6.4	Reinstall and reconnect air flow xmtr.	Mot-use hand tools to reinstall and reconnect		Given a repaired and recalibrated air flow xmtr. reinstall and reconnect in system in 5 min. with no procedural errors.	
	2.6.5	Open air supply and sensing lines to air flow xmtr.	Mot	Location		
	2.6.6	Parallel boiler master A/M sta. indicators	Per mot			
	2.6.7	Shift FO A/M to auto. [ST 4]	[ST 4]	[ST 4]		
		Shift FDB A/M sta. to auto. [ST 4]	[ST 4]	[ST 4] Console is now in one knob remote manual control on boiler master A/M sts.	Given an operating console with air flow xmtr. fault removed determine fron console front indications, periscope and smoke density meter that system now has ability to steam with clear stack in 3 min.	
		Stack not clear proceed to 1.3.1.3.3				
	3	Observe fuel loop	Diag. per mot	Sys. oper.		
	3.1	Observe characterizing relay O/P corresponds to I/P with calibration data proceed to 1.3.8.3.3	Diag. Text ref.	Location of calib. data-tech manual	Given a display indicating a properly calibrated characterizing relay determine that fault is in FO control valve & not charact. relay in 5 min w/100% accuracy	
	3.2	Observe characterizing relay O/P does not correspond to I/P with calibration data	1.3.8.3.1 Diag. Text ref.	1.3.8.3.1 Location of calib. data-tech manual	Given a display indicating a characterizing relay out of calib. according to calib. data determine that char. relay is source of trouble in 5 min w/100% accuracy	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess Super-heat Outlet Temperature	3.2.1.	Correct fault in char. relay Fault not corrected proceed to 1.3.8.3.3				
	3.2.2	Shift control of FO flow control valve to local manual using hand jack	Per mot use hand jack on FO flow cont. valve to take control and observe FO press gsge to determine when control in local manual is effected	Location of FO flow cont. valve hand jack and local press. gsge to (valve in space gage on gage board in space)	Given an operating FO flow control valve and indication of normal system FO pressure assume control of FO pressure in local min. in 3 min. with no procedural errors	
	3.2.3	Shut air supply valve to char. relsy		Location (under console)	Given an operating console into which a char. relay fault has been placed isolate & remove char. relay in 5 min. with no procedural errors.	
	3.2.4	Disconnect & remove char. relay	Mot use hand tools to disconnect & remove	Location of char. relay under console		
	3.2.5	[Insert cal. & repair]	[ ]	[ ]	[ ]	
	3.2.6	Reinstall & reconncet char. relay			Given an operating console and a repaired & recalibrated chsr. relay reinstall & reconnect in system in 5 min. with no procedural errors	
	3.2.7	Open supply air valve to char. relay	Mot.	Location	Given s reinstalled & reconnected char. relay deisolate and return to service in 3 min.	
	3.2.8	Shift control to FO flow control valve to remote manual	Per mot use hand jsck on FO flow control valve to return control to remote manual observe FO press gage to determine when remote manual control is effected	Location FO flow cont. valv. & local FO press. gage	Given an operating FO flow control valve and indications of normal FO system press effect remote manual control in 3 min. with no procedural errors.	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess Super-heat Outlet Temperature	3.3	Observe improper calibration of FO control valve	Per	Sys. oper. FO pressure relation to control pressure from char. relay (control press. x 5.63) + 20 psi = FO press.	Given a display indicating improper calibration of FO control valve, determine source of trouble in 5 min. w/100% accuracy	
	3.3.1.	Shift control of FO flow control valve to local manual	[———]	[———]	1.3.1.3.9.2.1	
	3.3.2	Crack open FO flow control valve bypass		(By-pass located near F/O control valve-in space)		
	3.3 3	Shut FO inlet valve to FO flow cont. valve while opening by-pass to assume control of FO press on by-pass	Mot-close one valve while opening another to maintain a smooth transition of control	(Isolation valves located near F/O control valve in-space)	Given an operating system shift control of FO pressure to the by-pass and isolate FO flow control valve	
	3.3.4	Shut FO outlet valve				
	3.3.5	Disconnect & remove FO flow control valve	Mot use hand tools to disconnect & remove			
	3.3.6	[Insert repair]	[ ]	[ ]	[ ]	
	3.3.7	Reinstall & reconnect Fo flow control valve	Mot			
	3.3.8	Open FO flow control valve outlet valve				
	3.3.9	Crack open inlet valve				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.8 Excess Super-heat Outlet Temperature	3.3.10	Shut by-pass valve while opening inlet valve to assume control of FO pressure on FO flow control valve in local manual	[1.3.1.3.1.0.2.3]			
	3.3.11	Shift control of FO flow control valve to remote man.	Not use hand jack to assume control in remote manual			
	3.3.12	Insert cal. for min. oil Press				
	3.3.13	Shift FO A/M sta. to auto [ST 1] and observe stacks clear	[ST 1]	[ST 1]	[ST 1]	
	3.3.14	Return control to operator				
End of high super head outlet temperature						

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.9 Incorrect MFP recirculation valve control		Incorrect MFP recir. control				
	1	Observe event-recir. valve does not close at proper time	Diag.- MFP at higher speed than normal for boiler load	System operation recirc. valve should close when MFP discharge volume above 22o/o	Given a display of a MFP recirc. control system, determine that system is not operating properly in 1 min w/100% accuracy	
	2	Observe system	Per	sys. oper.		
	2.1	Observe that toggling relay O/P = 65 psi when F/F xmtr. O/P >13.4 psi proceed to 1.3.9.2.3	Diag.	Location of gages under MFP control panel	Given a display indicating a toggling relay that is operating properly, determine that toggling relay is not source of trouble in 1 min. w/100% accuracy	
	2.2	Observe that toggling relay O/P 65 psi when F/F xmtr. O/P >13.4 psi	Diag.	1.3.9.2.1 Location of gages under MFP control panel	Given a display indicating a toggling relay containing a fault, determine that toggling relay is source of trouble in 1 min w/100% accuracy	
	2.2.1	Correct fault in toggling relay				
	2.2.1.1	Close supply air to toggling relay	Mot	Location of valve	Given a display containing a toggling relay in which a fault has been placed, isolate, disconnect, & remove toggling relay in 5 min. w/no procedural error	
	2.2.1.2	Close supply air to F/F xmtr.	Mot	Location of valve		
	2.2.1.3	Disconnect & remove toggling relay	Mot-use of hand tools	Location of toggling relay		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVF	COMMENTS
1.3.9 MFP Recirculation valve control	2.2.1.4	[Insert repair & cslib procedure]	[ ]	[ ]	[ ]	
	2.2.1.5	Install & reconnect toggling relay	Mot-use of hand tools	Location	Given a toggling relay in which a fault has been repaired, install, reconnect & deisolste in 5 min w/no procedursl error	
	2.2.1.6	Open supply air to toggling relay	Mot	Location of valve		
	2.2.1.7	Open supply air to F/F xmtr.	Mot	Location of valve	1.3.9.2.2.1.6 Given a toggling relay in which a fault has been repaired, install, reconnect & deisolate in 5 min. w/no procedural error	
	2.2.1.8	Observe that toggling relay O/P = 65 psi when F/F xmtr. O/P > 13.4 psi	Diag.	Location of gages [1.3.9.2.1]		
	2.3	Fault not corrected proceed to 1.3.9.2.3				
	2.3	Observe that O/P of 3 way pneumatic tranafer valve = 30 psi when O/P of toggling relay = 65 psi proceed to 1.3.9.2.5	Disg.	Location of gages supply air press. to 3-way valve must be 30 psi	Given a display indicating a 3-way pneumatic transfer valve that is operating correctly, determine that 3-way pneumatic transfer valve is not source of trouble in 1 min. w/100% accuracy	
	2.4	Observe that O/P of 3-way pneumatic transfer valve ≠ 30 psi when O/P of toggling relay = 65 psi	Diag.	1.3.9.2.3 Location of gages supply air press. to 3-way valve must be 30 psi	Given a display indicating a 3-way pneumatic transfer valve in which a fault has been plsced, determine that 3-way valve is source of trouble in 1 min. w/100% accurscy	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.9 MFP Recirculation valve control	2.4.1	Correct fault 3-way pneumatic transfer valve				
	2.4.1.1	Shut supply air to toggling relay	Mot	Location of valve	Given a display containing a 3-way pneumatic transfer valve in which a fault has been placed, isolate, disconnect & remove from system in 5 min w/o procedural errors	
	2.4.1.2	Shut supply air to 3-way pneumatic transfer valve	Mot	Location of valve		
	2.4.1.3	Disconnect & remove 3-way pneumatic transfer valve	Mot-use of hand tools	Location of 3-way pneumatic transfer valve		
	2.4.1.4	[Insert repair procedures]	[ ]	[ ]	[ ]	
	2.4.1.5	Install & reconnect 3-way pneumatic transfer valve	Mot-use of hand tools	Location of	Given a repaired 3-way pneumatic transfer valve, reinstall, connect, & deisolate in 5 min. w/no procedural error.	
	2.4.1.6	Open supply air to toggling relay	Mot	Location of valve		
	2.4.1.7	Open supply air to 3-way pneumatic transfer valve	Mot	Location of valve		
	2.4.1.8	Observe that O/P of 3-way pneumatic transfer valve = 30 psi when O/p of toggling relay = 65 psi Fault not corrected proceed to 1.3.9.2.5	Diag.	Location of gages	[1.3.9.2.3]	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.9 MFP Recirculation valve control	2.5	Observe that MFP recir. control valve is closed when O/P of 3-way pneumatic transfer valve = 30 psi proceed to 1.3.9.2.7	Diag.	Location of MFP recir. valve 3-way transfer valve	Given a display indicating a properly operating MFP recirc. control valve, determine that MFP recirc. control valve is not cause of trouble, & F/F xmtr. is faulty component in 1 min. w/100% accuracy	
	2.6	Observe that MFP recirc. control valve is not close when O/P of 3-way pneumatic transfer valve = 30 psi	Diag. 1.3.9.2.5	1.3.9.2.5 Location of MFP recir. valve 3-way transfer valve	Given a display indicating a MFP recirc. control valve that does not close when 3-way pneumatic transfer valve O/P = 30 psi determine that recirc. control valve is source of trouble in 1 min w/100% accuracy	
	2.6.1	Correct fault in MFP recirc. control valve				MFP must be secured & isolated if valve is to be worked on, but not for positioner
	2.6.1.1	Shut supply air to 3-way pneumatic transfer valve	Mot	Location	Given a display in which a MFP recirc. control valve containing a fault has been placed, isolate, disconnect, & remove in 15 min w/no procedural errors	
	2.6.1.2	Disconnect MFP recirc. control valve diaphram	Mot-use of hand tools	Location		
	2.6.1.3	Disconnect & remove MFP recirc. control valve	Mot	Location-remove only if valve is source of trouble		
	2.6.1.4	[Insert repair procedure]	[ ]	[ ]	[ ]	[ ]

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.9 MFP Recirculation valve control	2.6.1.5	Install & reconnect MFP recirc. control valve	Mot	Location	Given a MFP recirc. control valve in which a fault has been corrected, reinstall, connect & deisolate in 15 min. w/no procedural error	
	2.6.1.6	Open supply air to 3-way pneumatic transfer valve	Mot	Location		
	2.6.1.7	Observe that MFP recirc. control valve is closed when O/P fo 3-way pneumatic transfer valve = 30 psi Fault not corrected proceed to 1.3.9.2.7	Diag,	Location	[1.3.9.2.5]	
	2.7	Observe that F/F xmtr. O/P does not correspond to calib. data	Diag. text ref.	Sys. oper. Basic calib. $D/P = \frac{q_o^2}{100} x_{max} O/P_{max}$	Given a display indicating a faulty F/F xmtr., determine that F/F xmtr is source of trouble in 1 min. w/100% accuracy	
	2.7.1	Open equalizing valve on xmtr.		Location of valves (at xmtr. in space)		
	2.7.2	Shut sensing line valves	Mot	Location of valves (in space)		
	2.7.3	Blow down sensing to bilges				
	2.7.3.1	Open drain valve	Mot	(in space)		
	2.7.3.2	Blow down until all pressure is relieved	Per mot observe vent while opening valve	Person must be clear of vent while blowing down		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.3.9 MFP Recirculation valve control	2.7.4	Disconnect & remove xmtr. if required	Mot-use hand tools to disconnect & remove			Some xmtrs. may be repaired in place depending on ships configuration
	2.7.5	[Insert repair & calib.]	[ ]	[ ]	[ ]	
	2.7.6	Reinstall & reconncet if xmtr. was removed			Given a repaired and recalibrated xmtr. reinstall & reconnecting 10 min. w/o procedural error.	
	2.7.7	Place xmtr. in service [ST 5]	[ST 5]	[ST 5]	[ST 5]	
	3	Observe that MFP recirc. control valve closes at proper MFP discharge volume	Diag. MFP at proper speed	System oper.	Given a display indicating a properly operating MFP recirc. control system, determine proper operation of system in 1 min. w/100% accuracy	
End of MFP recirc. control event						

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HAGAN

OPERATIONAL READINESS

INSPECTION

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	Boiler secured (no wate.)	Observe combustion & feed water control systems w/boiler secured, containing no water	Per Mot, Diag	System Operation	Given a display representing a boiler control system w/boiler secured, containing no water, perform observations according to NavSec form 9510/7	Inspector would find boiler secured, containing no water, combustion & feed systems in manual, all A/M regulators turned fully counterclock - wise excess air adj. at normal
	1	Observe FO A/M station		Location of A/M console		
	1.1	Observe proper operation of FO A/M				
	1.1.1	Observe FO A/M O/P on "man" indicator to be "0"%	Per	Location of indicator on console	Given a display containing a F/O A/M w/o fsult, perform test, observe proper operation of F/O A/M & record results in IA, 9510/7	
	1.1.2	Turn FO A/M regular knob to the full clockwise position	Per Mot	Location of knob on console		
	1.1.3	Observe FO A/M O/P on "man" indicator to be 100% or greater	Per	Location of indicator on console		
	1.1.4	Observe proper operation of F/O A/M & mark Part 1 Question "A" "Yes". Proceed to 1.4.1.2	Diag, Per mot	Location of question on form. Desired range (0-100%)		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	1.2	Observe improper operation of F/O A/M				
	1.2.1	Observe F/O A/M "man" O/P	Per	Location of indicator on console	Given a display containing a F/O A/M in which a fault has been placed, perform test, observe improper operation of F/O A/M & record results in IA & IB, 9510/7a	
	1.2.2	Turn F/O A/M regulator knob to the full clockwise position	Per Mot	Location of knob on console		
	1.2.3	Observe F/O A/M "man" indicator	Per	Location of indicator on console		
	1.2.4	Observe F/O A/M "man" indicator range 0 - 100%	Diag	Desired range (0-100%)		
	1.2.5	Mark IA "No ", & enter actual range in IB. Proceed tol.4.1.2	Per Mot	Location of question on form		
	2	Observe F/O control valve				
	2.1	Observe that stem of Hagan F/O control valve is not visible	Per	Location of valve Type of valve	Given a display containing aHagan F/O control valve, determine that valve stem is not visible & record result in IC 9510/7.	
	2.2	Mark 1C "stem not visible" Proceed to 1.4.1.3	Per Mot	Location of question on form		
	3	Observe FDB A/M stations				
	3.1	Observe proper operation of FDB A/M stations				
	3.1.1	Observe #1FDB A/M "man" O/P=0%	Per	Location of indicator	Given a display containing AFDB A/M W/O fault, perform test, observe proper operation of FDB A/M & record results in ID, 9510/7.	
	3.1.2	Turn #1FDB A/M regulator knob to the full clockwise position	Per Mot	Location of knob on console		
	3.1.3	Observe #1FDB A/M "man" O/P = 100% or greater	Per	Location of indicator		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	3.1.4	Mark #1 in space provided in ID & "Yes" in block	Per Mot	Location of question desired range. (0-100%)		
	3.2	Observe proper operation of FDB A/M stations				
	3.2.1	Observe #1 FDB A/M "man" O/P	Per	Location of indicator	Given a display containing a FDB A/M in which a fault has been placed, perform test, observe improper operation of FDB A/M & record results in ID & IE, 9510/7	
	3.2.2	Turn #1 FDB A/M regulator knob to the full clockwise position	Per Mot	Location of regulator knob		
	3.2.3	Observe #1 FDB A/M "man" O/P	Per	Location of indicator		
	3.2.4	Observe #1 FDB A/M "man" O/P Range ≤ 0-100%	Diag.	Desired Range (0-100%)		
	3.2.5	Mark #1 in space provided in ID & IE	Per Mot	Location of questions		
	3.2.6	Mark "NO" block in ID	Per Mot			
	3.2.7	Mark actual range in IE	Per Mot			
	3.3	Perform procedures 1.4.1.3.1 thru 1.4.1.3.2.7 for each additional FDB A/M. Proceed to 1.4.1.4	1.4.1.3.1 thru 1.4.1.3.2.7	1.4.1.3.1 thru 1.4.1.3.2.7 Mark each FDB A/M # including FDB master A/M in additional spaces in ID & IE	1.4.1.3.1 thru 1.4.1.3.2.7	Omit questions F&G No movement at FDB governors, & no damper drives are installed
	4	Observe boiler A/M station				
	4.1	Observe proper operation of boiler A/M station				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	4.1.1	Observe boiler A/M "m n" O/P = 0%	Per	Location of ind'cator	Given a display containing a boiler A/M station W/O a fault, perform test, observe proper operation of boiler A/M & record results in IH, 9510/7	
	4.1.2	Turn boiler A/M regulat knob to full clockwise position	Per Mot	Location of knob on console		
	4.1.3	Observe boiler A/M "man" O/P = 100% or greater	Per	Location of indicator		
	4.1.4	Observe proper operation of boiler A/M & mark IH "Yes". Proceed to 1.4.1.5	Diag, Per Mot	Desired range, location of question (0-100%)		
	4.2	Observe improper operation of boiler A/M station			Given a display containing a boiler A/M station in which a fault has been placed, perform test, observe improper operation of boiler A/M, & Record results in IH & LI1, 9510/7	
	4.2.1	Observe boiler A/M "man" O/P	Per	Location of indicator		
	4.2.2	Turn boiler A/M regulator knob to full clockwise position	Per Mot	Location of knob on console		
	4.2.3	Observe boiler A/M "man" O/P	Per	Location of indicator		
	4.2.4	Observe boiler A/M "man" O/P range < 0-100%	Diag	Desired range (0-100%)		
	4.2.5	Mark "NO" block in IH	Per Mot	Location of question		
	4.2.6	Mark actual range in I1. Proceed to 1.4.1.5				
	5	Observe A/F controller				
	5.1	Observe proper operation of A/F controller				
	5.1.1	Set boiler A/M "man" O/P to 33% using regulator knob	Per Mot	Location of indicator & regulator		

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	5.1.2	Shift FDB A/M's to "auto"	[ST 1]	[ST 1]	[ST 1]	
	5.1.3	Shift FDB master A/M to "auto"	[ST 4]	[ST 4]	[ST 4]	
	5.1.4	Observe FDB A/M station O/Ps go to 100%	Per	Location of indicator (FDB master A/M "man" signal should not move) Location of question. Desired range (0-100%)	Given a display containing an A/F controller W/O a fault, perform test, observe proper operation of A/F controller & record results in IJ 9510/7	
	5.1.5	Mark "YES" in IJ. Proceed to 1.4.1.6	Per Mor			
	5.2	Observe improper operation of A/F controller				
	5.2.1	Set boiler A/M "man" O/P to 33% using regulator knob	Per Mor	Location of indicator & regulator		
	5.2.2	Shift FDB A/M's to "auto"	[ST 1]	[ST 1]	[ST 1]	
	5.2.3	Shift FDB master A/M to "auto"	[ST 4]	[ST 4]	[ST 4]	
	5.2.2	Observe FDB A/M O/Ps. Do not go to 100%	Per	Location of indicator	Given a display containing an A/F controller in which a fault has been placed, perform test, observe improper operation of A/F controller & record results in IJ, 9510/7	
	5.2.3	Mark "NO" in IJ. Proceed to 1.4.1.6	Per Mor	Location of question Desired range (0-100%)		
	6	Observe low signal selector				
	6.1	Observe proper operation of low signal selector				
	6.1.1	Shift F/O A/M to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	6.1.2	Observe F/O A/M "auto" O/P = 70%	Per	Location of indicator, sys. oper.	Given a display containing a low sig selector in which a fault has been placed, perform test, observe improper operation of low sig selector, & record result in IK, 9510/7	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	6.1.3	Mark "yes" in IK proceed to 1.4.1.7	Per mot	Location of question		
	6.2	Observe improper operation of low sig. selector				
	6.2.1	Shift F/O A/M to "auto" [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	6.2.2	Observe F/O A/M "auto" O/P > 0%	Per	Location of indicator, sys. oper.	Given a display containing a low sig. selector in which a fault has been placed, perform test, observe improper operation of low sig. selector & record result in IK, 9510/7	
	6.2.3	Mark "no" in IK	Per mot	Location of question		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	7	Observe feed A/M				
	7.1	Observe proper operation of feed A/M				
	7.1.1	Observe feed A/M "man" O/P = 0%	Per	Location of indicator	Given a display containing a feed A/M W/O a fault, perform test, observe proper operation of feed A/M & record results in IL, 9510/7	
	7.1.2	Turn feed A/M regular knob to full clockwise position	Per Mot	Location of regulator knob on console		
	7.1.3	Observe feed A/M "man" O/P = 100% or greater	Per	Location of indicator		
	7.1.4	Observe proper operation of feed A/M & mark "YES" in IL Proceed to 1.4.1.8	Diag	Location of question Desired range (0-100%)		
	7.2	Observe improper operation of feed A/M				
	7.2.1	Observe feed A/M "man" O/P	Per	Location of indicator	Given a display containing a feed A/M in which a fault has been placed, perform test, observe improper operation of feed A/M, & record results in IL & IM, 9510/7.	
	7.2.2	Turn feed A/M regulator knob to full clockwise position	Per Mot	Location of regulator knob on console		
	7.2.3	Observe feed A/M "man" O/P	Per	Location of indicator		
	7.2.4	Observe feed A/M "man" O/P range≠0-100%	Diag	Desired Range (0-100%)		
	7.2.5	Mark "NO" in IL	Per Mot	Location of question		
	7.2.6	Mark actual range in space provided in IM. Proceed to 1.4.1.8	Per Mot			
	8	Observe feedwater control valve stroke				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	8.2.4	Observe feed valve, noting position of marker on stem	Per	Location of valve		
	8.2.5	Using feed A/M regulator knob set "man" O/P @ 100%	Per Mot	Location of indicator and regulator knob		
	8.2.6	Observe feed valve, noting position of market on stem	Per	Location of valve		
	8.2.7	Observe that feed valve positions do not correspond to 0%. 50% or 100% feed A/M O/P	Diag	Desired valve movement		
	8.2.8	Mark "NO" in I-N. Proceed to 1.4.1.9	Per Mot	Location of Question		
	9	Observe feed flow controller				
	9.1	Observe proper operation of feed flow controller				
	9.1.1	Shift feed A/M to Auto [ST 42]	[ST 4]	[ST 4]	[ST 4]	
	9.1.2	Observe that feed A/M "auto" O/P ↑ to 100% or greater	Per	Location of indicator	Given a display containing a feed flow controller in which a fault has been placed and a feed A/M station, perform test, observe improper operation of feed flow controller, and record results in I-O, 9510/7	
	9.1.3	Mark "NO" in I-O. Proceed to 1.4.1.10.				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	9.2	Observe improper operation of feed flow controller				
	9.2.1	Shift feed A/M to auto [ST 4]	[ST 4]	[ST 4]	[ST 4]	
	9.2.2	Observe that feed A/M "auto" O/P ↑ to 100%	Per	Location of indicator desired O/P sys. oper.	Given a display containing a feed flow controller in which a fault has been placed & a feed A/M station, perform test, observe improper operation of feed flow controller, & record results in I-O, 9510/7.	
	9.2.3	Mark "NO" in I-O. Proceed to 1.4.1.10.				
	10	Observe primary element xmtrs O/P's				
	10.1	Observe primary element xmtrs to be at proper values				
	10.1.1	Observe D/L xmtr O/P = 60 psi	Per	Location of xmtr	Given a display of all boiler xmtrs at proper values, make observations of primary element xmtrs, and record results in I-P, I-Q 9510/7	D/L xmtr O/P = 60 psi because no water in boiler
	10.1.2	Observe O/P of all xtmrs. associated with boiler except D/L to be at "0" psi	Per	Location of xmtrs, number of xmtrs. S/F xmtr, F/F xmtr, A/F xmtr, steam pressure controller		
	10.1.3	Mark "NO" in I-P	Per Mor	Location of question		
	10.1.4	Mark "D/L xmtr # -", & 60 psi O/P in space provided in I-Q Proceed to 1.4.1.11	Per Mor	Location of question		
	10.2	Observe primary element xmtr O/P's not at proper values				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	10.2.1	Observe O/P of xmtr other than P/L xmtr =/ Opsi	Per	Location of xmtrs	Given a display indicating D/L xmtr O/P @ proper value and other xmtr not at proper value, make observations of primary element xtrs & record results in I-P & I-Q, 9510/7	
	10.2.1.1	Mark "NO" in I-P	Per Mot	Location of question		
	10.2.1.2	Mark "D/L xmtr #-" & D/L xmtr O/P in I-Q. Name of other xmtr & O/P. Proceed to 1.4.1.11	Per Mot			
	2.2	Observe that O/P of all primary element xmtrs = 0 psi	Per	Location of xmtrs	Given a display of all primary element xmtr O/Ps @ 0 psi, make observations & record results in I-P, 9510/7	"YES" in I-P indicates D/L xmtr not at proper value
	10.2.2.1	Mark "YES" in I-P. Proceed to 1.4.1.11.	Per Mot	Location of question		
	11	Observe G.R. characterizing relay				Applicable to systems w/ G.R. char. relay installed only. Omit if system uses Hagen char. relay
	11.1	Observe proper operation of G.R. characterizing relay				
	11.1.1	Shift F/O A/M to "man" ST 3	ST 3	ST 3	ST 3	
	11.1.2	Using F/O A/M regulating knob, set F/O A/M "man" O/P @ "0%"	Per Mot	Location of F/O A/M	Given a display containing a G.R. char. relay w/o a fault, & a F/O A/M, perform test, observe proper operation of G.R. char. relay, & record result in I-R 9510/7	
	11.1.3	Observe char. relay rack to be at lowest position	Per	Location of char. relay (under console) Location of rack in char. relay. Proper movement (0-100%)		
	11.1.4	Using F/O A/M regulating knob, set F/O A/M "man" O/P @ 100%	Per Mot	Location of F/O A/M		

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	11.1.5	Observe char. relay rack to be fully extended	Per	[1.4.1.11.1.3]		
	11.1.6	Mark "YES" in I-R. Proceed to 1.4.1.12	Per Mot	Location of question		
	11.2	Observe improper operation of G.R. char. relay				
	11.2.1	Shift F/O A/M to man [ST 3]	[ST 3]	[ST 3]	[ST 3]	
	11.2.2	Using F/O A/M regulating knob, set F/O A/M "man" O/P @ 0%	Per Mot	Location of F/O A/M	Given a display containing a G.R. char. relay in which a fault has been placed, & a F/O A/M, perform test, observe improper operation of G.R. char. relay & record results in I-R & I-S, 9510/7	
	11.2.3	Observe position of char. relay rack	Per	Location of char. relay & rack		
	11.2.4	Using F/O A/M regulating knob, set F/O A/M "man" O/P @ 100%	Per Mot	Location of F/O A/M		
	11.2.5	Observe that G.R. char. relay rack does not travel to exactly to 100% stroke when F/O A/M O/P = exactly 100%	Diag.	Location of G.R. char. relay, 100% stroke position		
	11.2.6	Mark "NO" in I-R	Per Mot	Location of question		
	11.2.7	Mark actual F/O A/M O/P (min. & max) required to make rack move full stroke in space provided in I-S. Proceed to 1.4.1.12.	Per Mot			
	12	Observe supply air				
	12.1	Observe supply air to be free of water & oil				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	12.1.1	Open supply air filter downstream drain valve	Mot	Location of drain valve	Given a display of supply air filter operating properly, perform test, determine that air is free of oil & water, & record results in I-T, 9510/7.	
	12.1.2	Observe no water or oil from drain valve	Per	Appearance of water & oil		
	12.1.3	Shut supply air filter downstream drain valve	Mot	Location of drain valve		
	12.1.4	Mark "YES" in I-T. Proceed to 1.4.1.13	Per Mot	Location of question		
	12.2	Observe supply sir contains water & oil				
	12.2.1	Open supply air filter downstream drain valve	Mot	Location of drain valve	Given a display of supply sir filteroperating improperly, perform test, determine that air is contsminated with oil & water & record results in I-T, 9510/7	
	12.2.2	Observe water or oil comes from drain valve	Per	Appearance of water & oil		
	12.2.3	Shut supply air filter drain valve	Mot	Location of valve	Record result in I-T, 9510/7	
	12.2.4	Mark "NO" in I-T. Proceed to 1.4.1.13	Per Mot	Location of question		
	13.	Observe supply air pressure				
	13.1	Observe supply air pressures set at correct values	Per	Location of reducers & pressure gages. Desired values _____ Hagen - 65 psi. Mason Nielan -22 psi. Leslie - 22 psi. Volume booster - 22 psi. GR char relay - 65 psi Psys Range mod-50 psi P A/M stations - 50 psi	Given a displsy containing air reducers set at proper values, perform observstion of reducers, & record results in I-U, 9510/7	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.1 Cold Plant Inspection	13.1.1	Mark "yes in I-U proceed to 1.4.1.14	Per mot	Location of question		
	13.2	Observe supply air pressures set at incorrect valves	Per	1.4.1.13.1	Given a display containing air reducers set at incorrect valves, perform observations and record results in I-U & IV, 9510/7	
	13.2.1	Mark "no" in I-U	Per mot	Location of question		
	13.2.2	Mark name of incorrectly set reducers & actual values in I-Y proceed to 1.4.1.14	Per mot	Location of question		
	14	Complete remarks section of 9510/7	Per mot diag.	Applicable comments, explain deficiencies listed in Part I, 9510/7, sys. oper.	Given a completed 9510/7 Part I, explsin deficiencies in "remarks" section	
		End of cold plant inspection				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 HOT PLANT INSPECTION	Boiler Steaming	Observe combustion & feed water control systems with boiler steaming under stable & maneuvering conditions				Inspector finds boiler on line, with operating personnel on watch. Does not assume watch, but observes.
	1	Determine steaming load of boiler	Per, diag. Next ret.	Methods- 1.) Pen recorder 2.) Fuel meter reading 3.) S/F xmtr. O/P 4.) Burner capacity curve (location of burner cap. curves in boiler manual)	Given a display of an operating boiler with control system, determine steaming load, and enter result in II-A, 9510/7	
	1.1	Enter steaming load in II-A proceed to 1.4.2.2	Per Not	Thousand LB/LR, (enter manuevering if manuevering)		
	2	Determine # of boilers on line	Per	Ask operating personnel	Given a display with 1 or 2 boilers on line, determine # of boilers & enter result in II-B, 9510/7	
	2.1	Enter # of boilers on line in II-B proceed to 1.4.2.3	Not	Location of question		
	3	Observe operation of combustion control system	Per	Location of A/M stations		
	3.1	Observe combustion control system to be in "full automatic" operation	Per	Position of xfer. switches to indicate "auto" operation "full auto" = A/M for all regulated elements	Given a display of a combustion system in full auto, determine that system is in full auto. & enter result in II C, 9510/7	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	3.1 cont.			boiler A/M F/O A/M operating FDB A/M FDB master A/M		
	3.1.1	Mark "yes" in II-C if 1.4.2.3.1.1 is yes proceed to 1.4.2.6	Per mot	Location of question		
	3.2	Observe combustion control system not in "full automatic"	Per	Position of xfer. switches to indicate "auto" or "man" mode boiler A/M F/O A/M Operating FDB A/M FDB master A/M one or more A/M in "man" mode	Given a display of a combustion system not in full auto, observe elements not in auto, & record results in II-C & II D, 9510/7	
	3.2.1	Mark "no", in II-C	Per mot	Location of question		
	3.2.2	Obs rve boiler master A/ . in auto.	Per	Position of xfer. switch		
	3.2.2.1	Mark "yes" in II-D-1	Per mot			
	3.2.2.3	Observe boiler master A/M in man.	Per	Position of xfer. switch		
	3.2.3.1	Mark 'no" in II-D-1	Per mot			
	3.2.4	Observe F/O A/M in auto	Per	Position of xfer. switch		
	3.2.4.1	Mark "yes" in II-D-2	Per mot			
	3.2.5	Observe F/O A/M in man.	Per	Position of xfer. switch		
	3.2.5.1	Mark "no" in II-D-2	Per mot			

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	3.2.6	Obaerve all FDB A/M's in auto	Per	Position of xfer. switch		
	3.2.6.1	Mark "yes" in I-D-3	Per mot			
	3.2.7	Observe all FDB A/M's not in auto.	Per	Position of xfer. switches		
	3.2.7.1	Mark "no" in II -D-3	Per mot			
	3.2.7.2	Mark # of FDB A/M's in "man" in spacea provided in II-D-3 & "no" beside # of FDB A/M proceed to 1.4.2.4	Per mot			
	4	Obaerve control of F/O press.				
	4.1	Observe control of F/O press. to be in remote manual	Per	Remote manual- F/O press. controlled from F/O A/M, by oper. personnel	Given a display of a combustion system w/ F/O A/M in remote manual, observe control of F/O press. in remote man. & record results in II-E, 9510/7	
	4.1.1	Mark "yes" in II-E proceed to 1.4.2.5	Per mot			
	4.2	Observe control of F/O press. to be in local man.	Per	Local manual - F/O press. controlled by operating personnel using F/O control valve or bypass valve	Given a display of a combustion system w/ control of F/O press. in local, anual, observe local manual control, & record results in II-E, 9510/7	
	4.2.1	Mark "no" in II-E proceed to 1.4.2.5	Per mot	Location of question		
	5	Observe control of FDB				

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	5.1	Observe control of FDB's to be in remote manual	Per	FDB rpm controlled by operating personnel using FDB A/M's	Given a display of a combustion system w/control of FDB's in remote man., observe control of FDB's in remote manual & record results in II-F, 9510/7	
	5.1.1	Mark "yes" in II-F	Per mot	Locstion of question		
	5.2	Observe control of FDB's to be in local manual	Per	FDB RPM controlled by operating personnel using manual throttle valves	Given a display of a combustion control system w/control of FDB's in local manual, observe control of FDB's in local manual & record result in II-F 9510/7	
	5.2.1	Mark "no" in II-F proceed to 1.4.2.6	Per mot	Location of question		
	6	Observe operation of FDB's				
	6.1	Observe control of FDB's not to be in "auto" proceed to 1.4.2.7	Per	Position of FDB A/M xfer. switches in manual		
	6.2	Observe control of FDB's to be in "auto"	Per	Position of FDB A/M to be in "auto"		
	6.2.1	Observe proper operation of FDB's				
	6.2.1.1	Observe FDB rpm's at steady boiler load = ± 200 rpm	Per	Location of FDB tschs.	Given a display of a combustion control system W/FDB A/M's in "auto", observe FDB rpm's = within 200, at all stesdy loads & record result in II-G, 9510/7	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	2.1.2	Observe FDB rpm's at steady boiler load, after a load change = ± 200 rpm	Per	Location of FDB tachs.		
	6.2.1.3	Mark "yes" in II-G proceed to 1.4.2.7	Per mot	Location of question		
	6.2.2	Observe improper operation of FDB's				
	6.2.2.1	Observe FDB rpm's at steady boiler load	Per	Location of FDB tachs	Given a display of a combustion control system W/FDB A/M's in "auto" observe FDB rpm's≠ ± zod at steady loads, record results in II-G & II-H, 9510/7	
	6.2.2.2	Observe FDB rpm's at steady boiler load, after a load change	Per	Location of FDB tachs	Given a display of a combustion control system w/FDB A/M's in "auto" observe FDB prm's ≠ ± zod at steady loads, record results in II-G & II-H 9510/7	
	6.2.2.3	Observe FDB rpm's ≠ ± 200 at steady boiler loads	Diag.	FDB's rpm's must be paralled within 200 rpm at steady boiler loads		
	6.2.2.4	Mark "no" in II-G	Per mot	Location of question		
	6.2.2.5	Mark largest rpm difference, at steady state, observed, in II-H proceed to 1.4.2.7	Per mot, MEM	Methods of subtraction		
	7	Observe excess air setting				

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	7.1	Determine "normal" setting	Question operating personnel	Permissible ranges overload burners - 50% full power 56-60%	Determine, from operating personnel, excess air adj. normal setting	
	7.1.1	Observe "normal" setting of excess air adjuster	Per	Location of indicator on console. Normal = 50% (O/L) 56060% (F/P)	Given a display of a comb. control system w/excess sir setting normal, observe proper setting, & record results in II-I 9510/7	
	7.1.1.1	Mark "yes" in II-I proceed to 1.4.2.8	Per mot	Location of question		
	7.1.2	Observe setting of excess air adjuster not to be normal	Per	[1.4.2.7.1.1]	Given a display of a comb. control system w/excess air setting not normal observe setting & record result in II-I, 9510/7	
	7.1.2.1	Mark "no" in II-I proceed to 1.4.2.8	Per mot	Location of question		
	8	Observe combustion control system during boiler load change				
	8.1	Observe that excess air setting is not changed during boiler load change	Per	Location of excess air adj. on console (no smoke in periscope)	Given a display of a comb. control system in auto. during a boiler load change, observe excess air, adj. boiler master A/M, & FDB A/M stations & record results in II-J 9510/7	
	8.1.1	Mark "yes" in space provided in II-J	Per mot	Location of question		
	8.2	Observe that excess air adj. is changed during boiler load change	Per	Location of excess air adj. on console		

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	8.2.1	Mark "nd' in II-J in space provided	Per mot	Location of question		
	8.3	Observe boiler A/M bias not changed during boiler load change	Per	Location of A/M		
	8.3.1	Mark "yes" in space provided in II-J	Per mot	Location of question		
	8.4	Observe boiler A/M bias changed during boiler load change	Per	Location of A/M		
	8.4.1	Mark "no" in space provided in II-J	Per mot	Location of question		
	8.5	Observe FDB A/M bias not to be changed during boiler load change	Per	Location of A/M's		
	8.5.1	Mark "yes" in space provided in II-J	Per mot	Location of question		
	8.6	Observe FDB A/M bias is changed during boiler load change	Per	Location of A/M's		
	8.6.1	Mark "no" in space provided in II-J	Per mot	Location of question		
		If II-C is "yes" proceed to 1.4.2.9 if II-C is "no" proceed to 1.4.2.10				
	9	Observe control of steam press. during boiler load change				
	9.1	Observe correct steam press. is maintained as boiler load is changed	Per	Location of stm. press. gage (1275 psi ± 10%	Given a display of a comb. control system in auto.	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inapection	9.1.1	Mark "yes" in II-K proceed to 1.4.2.11	Per mot	Location of quest.	Observe proper control of steam press. during boiler load change & record result in II-K 95.0/7	
	9.2	Observe that correct atm. press. is not maintained as boiler load is changed	Per	Location of stm. press. gage (allowed 1275 psi ±10%)	Given a display of a comb. control system in auto. observe that proper steam press. is not maintained during boiler load change, & record result in II-K 9510/7	
	9.2.1	Mark "no" in II-K proceed to 1.4.2.11	Per mot	Location of question		
	10	Question operating personnel for reasons why comb. control system not in full auto.	Eval.	Sys. oper. (ask knowledgable personnel)	Given a display of a comb. control system not in full auto. solicit reasons for not being in full auto. & record in "remarks" section 9510/7	
	10.1	Record answers in "remarks" section	Per mot	Location of "remarks" sec. (back of gage)		
	11	Observe feed A/M				
	11.1	Observe feed A/M to be in auto	Per	Location of A/M position of xfer. switch	Given a display of feed system w/feed A/M in auto. observe feed A/M in auto & record result in II-M 9510/7	
	11.1.1	Mark "yes" in II-M proceed to 1.4.2.14	Per mot	Location of quest.		
	11.2	Observe feed A/M to be in "man"	Per	Location of A/M position of xfer. switch	Given a display of feed system w/feed A/M in "man" observe feed A/M not in auto & record result in II-M, 9510/7	

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE
1.4.2 Hot Plant Inspection	11.2.1	Mark "no" in II-M proceed to 1.4.2.12	Per mot	Location of quest.	
	12	Observe manual control of feed control valve			
	12.1	Observe operating personnel controlling feed valve using feed A/M in manual	Per	Location of feed A/M position of feed A/M xfer switch	Given a display of feed valve in remote manual control, make observation, & record result in II-N 9510/7
	12.1.1	Mark "yes" in II-N proceed to 1.4.2.14	Per mot	Location of quest.	
	12.2	Observe operating personnel not using feed A/M to control feed valve	Per	Location of feed A/M operating personnel controlling feed valve in local manual at valve	Given a display of feed valve in locsl manual make observation, & record result in II-N 9510/7
	12.2.1	Mark "no" in II-N proceed to 1.4.2.13	Per mot	Location of quest.	
	13	Explain necessity for local manual operation of feed control valve	Diag.	Sys. oper. (quest. maint. personnel for reasons)	Given reasons by maint. personnel for feed sys. in locsl man. evsluate for valid reasons, & record in 'remsrks' section of 9510/7
	13.1	Make notation in remarks section if II-M is "no" proceed to 1.4.2.17 If II-M is "yes" proceed to 1.4.2.14	Per mot	Location of "remarks" sect.	
	14	Observe boiler water level at steady boiler load			

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EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	14.1	Observe proper water level	Diag. (relation of actual & desired W/L)	Location of boiler gage glass (W/L=NWL ± 1/2 " is permissible)	Given a display of feed system in auto W/steady boiler load observe proper W/L & record results in II-P 9510/7	
	14.1.1	Mark "yes" in II-P proceed to 1.4.2.15	Per mot	Location of quest.		
	14.2	Observe W/L not at proper level	Diag. (relation of actual & desired W/L)	Location of boiler gage glass (W/L = NWL ± 1/2" permissible	Given a display of feed sys. in auto. W/steady boiler load, observe improper W/L & record result in II-P 9510/7	
	14.2.1	Mark "no" in II-P Proceed to 1.4.2.16	Per mot	Location of quest.		
	15	Observe boiler W/L during boiler load change				
	15.1	Observe proper control of boiler W/L	Diag.	Location of gage glass (W/L = NWL ± 4" during change is allowed)	Given a display of feed sys. in auto. observe proper control of W/L during boiler load change & record results in II-Q 9510/7	
	15.1.1	Mark "yes" in II-Q proceed to 1.4.2.16	Per mot	Location of quest.		
	15.2	Observe improper control of boiler W/L	Diag.	Location of gage glass (W/L exceeds ± 4" from NWL during change)	Given a display of feed sys. in auto., observe improper control of W/l during boiler load change, & record results in II-Q 9510/7	

EVENT		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	15.2.1	Mark "no" in II-Q proceed to 1.4.2.16	Per mot	Location of quest.		
	16	Observe S/F xmtr. & F/F xmtr. O/P's at steady boiler load				
	16.1	Observe S/F xmtr. O/P & F/F xmtr. O/P = ±	Diag.	Location of gages (1%=.6 psi)	Given a display of feed sys. in auto. observe proper S/F xmtr. & F/F xmtr. O/P, & record results in II-R 9510/7	
	16.1.1	Mark "yes" in II-R proceed to 1.4.2.18	Per mot	Location of quest.		
	16.2	Observe S/F xmtr. O/P & F/F xmtr. O/P ≠ ± 2%	Diag.	Location of gsges (1% =.6 psi)	Given a display of feed sys. in auto. observe improper S/F xmtr. & F/F xmtr. O/P's & record results in II-R & II-S, 9510/7	
	16.2.1	Mark "no" in II-R	Per mot	Location of quest.		
	16.2.2	Mark actual S/F xmtr. O/P & F/F xmtr. O/P in spaces provided in II-S proceed to 1.4.2.18	Per mot	Location of quest.		
	17	Question operating personnel for reasons why feed sys. not in full "auto"	Eval.	Sys. oper. (ask knowledgable per sonnel)	Given a display of feed sys. not in auot solicit reasons for not being in auto from operating personnel, & record in remarks section, 9510/7	
	17.1	Record answers in "remarks" section	Per mot	Location of "remarks" section		

EVENTS		TASK	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
1.4.2 Hot Plant Inspection	18	Observe fuel loop at steady boiler load				
	18.1	Observe FO A/M auto O/P in suto = boiler A/M O/P	Diag.	Location of indicators (sys. oper. - low signal operation)	Given a display of a comb. sys. at steady boiler load, in full auto. observe proper operation of low sig. selector, & record results in II-U 9510/7	
	18.1.1	Mark "yes" in II-U proceed to 1.4.2.19	Per mot	(Location of quest)		
	18.2	Observe FO A/M auto O/P in auto ≠ boiler A/M O/P	Diag.	Location of indicators (sys. oper-low signal operation)	Given a display of s comb. sys. at steady boiler load in ull auto., observe improper operation of low signal & record results in II-U & II-Y, 9510/7	
	18.2.1	Mark "no" in II-U	Per mot	Location of queat.		
	18.2.2	Mark F/O A/M O/P & boiler A/M O/P in II-V proceed to 1.4.2.19	Per mot	Location of quest.		
	19	Complete remarks section of 9510/7	Per mot diag.	Applicable comments concerning system operation & deficiencies, listed in Part II 9510/7 knowledge of comb. & feed sys. oper.	Given a completed 9510/7 Part II, explain deficiencies in "remarks" section	

END OF HOT PLANT INSPECTION

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Surveys Weekly Schedule (W/S)	Planned Maintenance (P/M)	1. Extracts P/M info from W/S	Perceptual - Locate his name by scanning W/S & locate P/M to be performed	Frequency coding & P/M calendar	Locate & extract information from W/S in order to identify correct maintenance requirement card (MRC)	Tasks 1, 2 & 3 are common to all P/M procedures
		2. Pulls MRC from BT work center deck	Memory -	MRC series no. location on card	Discriminate between MRC required and all other MRC's	Deck contains not only Acc cards but all work center cards for the space
		3. Determines from the MRC Specific tools and maintenance required	Text Retrieval - Extract pertinent information from MRC	MRC information format	Locate & extract tool and maintenance procedures from MRC's	1, 2 & 3 will preface all following P/M procedures
		4. A observes front panel indications on Acc console				
		5. B observes Plant Indications				
Begins Maint. Procedure	P/M air flow XMTR impulse Lines. L-278	6. Ensures control system is not in use	Perceptual & Memory - Evaluates gage indications to ensure control is not in use	Acceptability of console & plant indications to ensure system is not in use	Identify gage indications & valves that will indicate system is not in use	This could also be information from watch stander that boiler is secured
		7. Wires draft gage sensing valve shut	Motor - Organizational draw safety wire from stowage & applies to valve	Location of draft gage sensing valve in system	Technique of safety wiring valves	
		8. Tags draft gage sensing valve "DO NOT OPEN"		Information to be written on tag	Writing correct & complete information on tags and placing tags securely on valves	

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EVENT	SYS. OPER.		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Maint. Procedure (Cont)	P/M Air Flow XMTR Impulse Lines L-278 (Cont'd)	9.	Carries out tag out procedure	Organization - finding appropriate officers around ship to sign out tag out sheets	Information required for filling out ships form and which supervisors to turn in to. Tag out procedure will vary if ship is at ses or in port.	Filling out ships tag out form	These forms will vary from ship to ship but they follow a general pattern
		10.	Assembles tools listed on M'C L 278	Organizational	Hand Tools	Identify correct tools listed on MRC	
		11.	Disconnects Impulse Lines at XMTR	Motor - Use hand tools to disconnect fittings	Location of impulse lines	Proper technique of disconnecting airtight fittings without damage	
		12.	Attaches L pair hose to fire box impulse line	Motor - Use of hand tools to make up fittings	Location of acceptable air source	Proper technique of making up airtight fittings and identification of acceptable air source	
		13.	Checks sensing line valves open	Motor - Opening valves	Location of sensing line valves	Importance of having clear path for blow out	
		14.	Blows through lines with L.P. air to clean out dirt and combusion deposits [Caution: do not blow air into XMTR connections]	Motor	Ruptured diaphram damage could occur	Acquire correct methods of utilizing compressed air to clean out lines	
		15.	Removes LP air hose from fire box impulse lines	Motor -			
		16.	Reconnects impulse lines at transmitter	Motor - Use hand tools to make up fittings			

EVENT	SYS. OPER.		TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Maint. Procedure (Cont)	P/M Air Flow XMTR Impulse Lines L-278 (Cont'd)	17.	Cuts in signal air & tests for leaks				
		18.	A mskes up soap solution	Perceptual - Soap solution consistency		Proper technique for soap tests of fittings	
		19.	B opens valve				
		20.	C spplies soap solution to fittings	Motor - apply soap solution to fittings	Indication of leaks		
		21.	Decision - is it good or bad				
		22.	Cleans fire box impulse line moisture setting chamber	Perceptual - motor looks inside clesns out look inside some more			No documentstion on this procedure available
		23.	Cleans wind box impulse line				
		24.	A attaches LP air hose to wind box impulse line	Motor - Use of hand tools to make up fittings	Location of acceptable air sourcc	Proper technique of making up air tight fittings	
		25.	B blows through line with LP air to clear line of dirt & combustion deposits	As 12		As 12	
		26.	Removes LP air hose from fire box impulse lines	Motor - Organizational	Hose stowsge	Return tools & accessory gear to stowage	
		27.	Reconnects wind box impulse lines				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Maint. Procedure (Cont'd)	P/M Air Flow XMTR Impulse Lines L-278 (Cont'd)	28. Removes wire & safety teg from draft gage sensing velve and opens draft gege sensing valve				
		29. Completes tag out procedure	Organizational - as 7	Completing ships tagout form	Importance of reporting complation of tag out procedure	
Scheduled	P/M Blowe downstream pressure controller impulse lines MRC L-279 .2 hours	1. Ensurea control system is not in use or ia in remote manual mode of operation A requests topvatch to instruct console operator to shift to remote manual if sys. is in use and in auto mode	Perceptual & Memory - Evaluate gage indications to determine if control is not in use or is in remote manual	Acceptability of coneole & plant indicatione to ensure sys. ie not in uea or ia in remota manual	Identify gage indications and velues that will indicate sye. is not in use or ie in remota manual	Preceded by 1, 2 & 3 of Page 1
		2. Shuts sensing valve on top of settline chamber	Motor -	Location of Valve		
		3. Open settline chamber drain valves slightly and blow until cleen steam appears	Motor -	Locetion of Drain Valves	Corract techniqua of blow down procedure	
		4. Shuts settline chamber drain valve	Motor -	Location of Drein Valvee		
		5. Obeervea settline chamber	Perceptual			
		6. Allows settline chauber to condense until cool to the touch	Kinesthetic - Discriminate between hot & cold by touch		Frame of referenca for what is cool in a fire room	

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EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled (Cont'd)	P/M Blows downstream pressure controller impulse lines MRC L-279 .2 hours (Cont'd)	7. Cracks sensine line valve open slightly to slowly pressurize controlier [Caution: Steam or water to enter bellows	Perceptual - Motor - Observes installed gage while opening valve	Results of application at high temp stream or water on bellows	Correct techniques of repressurisation of high press & temp. componants	
		8. Open sensing valve fully	Perceptual - Motor Observes installed gage to determine if controller is fully pressurized	Full system preasure		
		9. Informs top watch that controller's back in service				
Scheduled	P/M clean component poppet valves MRC L-280 1.5 hours	TASK NOTE: The following P/M procedure applies to the components listed.				
		1. Low signal selector				
		2. High signal selector				
		3. Selector relay				
		4. Manual signal generator				
		5. Fuel/air ratio relay				
		6. Automatic/manual signal generator				
		7. Delta "P" XMTRS				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
		1. Ensure controls are not in use	Perceptual & Memory - Evaluates gage indication to ensure control is not in use	Acceptability of console & plant indicetions to ensure control sys is not in use	Identify gage indications & valves that indicate sys. is not in use	
		2. Assemblee tools A. Fleshlite B. Lint Free Rags C. Allen Wrench Set D. 5" Adjustable Wrench E. 1/2 Pint Inhibited Methyl Chloroform	Organizational - remove tools from stowage	Identify hand tools	Assemble & inventory tools required	I have never seen "LINT FREE RAGS" in an engineering space, yet all procedures list them
		3. Remove component cover	Motor - Allen wrenches to remove screws	Location of component	Poppet valve cleaning procedure	
		4. Shut component air supply	Motor - shuting valves	Location of air supply		
		5. Remove air line	Motor - Disconnecting air fittings			
		6. Loosen lock nut	Motor - Use ADJ wrench to loosen lock nut	Location of lock nut	Identify component parts	
		7. Remove poppet valve from component	Motor -			

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean component poppet valves MRC L-280 (Cont'd)	WARNING: Ensure at least two persons are in work area when using inhibited methyl chloroform	Motor - Facility using dangerous solvents	Danger of prolonged contact with methyl chloroform	Handling of dangerous solvents and the requirements during use	What constitutes adequate ventilation has not been defined
		8. Provide adequate ventilation	Organization & Perceptual - detect when fumes are too strong	Danger of inhalation of methyl chloroform- Location of ventilation switches		
		9. Clean poppet valve with methyl chloroform	Motor			
		10. Clean valve stem	Motor			
		11. Clean inlet & exhaust seats	Motor			
		12. Inspect inlet & exhaust seats for nicks and pitting	Perceptual - Kinesthetic Inspect visually and by feel		Correct inspection procedures	
		13. Reinstall valve in component	Perceptual - Motor		Screw valve in place in component until stem just touches exhaust seat, indicated by observing valve stem just starts to move away from inlet seat	
		14. Hold valve and tighten lock nut	Motor			
		15. Reinstall air line	Motor		Proper technique of making up air tight fittings	
		16. Open component air supply	Motor	Location of Valve		

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean component poppet valves MRC L-280 (Cont'd)	17. Inspect for leaks				
		A makes up soap solution	Perceptual - Soap solution consistency		Proper technique for soap tests of air filters	
		B applies soap solution to fittings	Motor - Applies soap solution	Indications of leaks		
		18. Reinstall component cover	Motor			
Scheduled	P/M Clean component valves MRC-L281	The following P/M procedure applies to the components listed.				
		1. Steam Pressure Controller				
		2. Air flow XMTR				
		3. Steam flow XMTR				
		4. Feed flow XMTR				
		5. Drum level XMTR				
		6. Header preaa controller				
		1. Ensures boiler is not in use	Perceptual - Memory - Evaluates gage indications to ensure boiler not in use	Acceptability of console & plant indications to ensure boiler not in use	Identify gage indications & valves that indicate boiler out of service	This will apply for all components listed
		2. Assembles tools and materials.	Organizational - Remove tools from stowage	Location of air supply valve for each component	Locate & identify system air supply valves	
		A. LP air hose				
		B. Lint free rags				
		C. Allen Wrench set				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean valves MkC-L281 (Cont'd)	D. 6" adjustable wrench E. 6" screw driver F. 1/2 pint inhibited methyl chloroform				
		3. Isolate each component by shutting air supply valve	Motor - closing valve	Location of air supply valve for each component	Locate & identify system air supply valves	
		4. Remove component cover	Motor - Use Allen wrench to remove screws		Escapement valve cleaning procedure	
		5. Remove Allen screws from escapement valve body	Motor - Use Allen wrench to remove screws	Location of screws in valve body	Disassemble & identify component parts	
		6. Remove escapement valve as a unit	Motor -			
		7. Loosen lock nut and turn upper seat counterclockwise until it clears thread - catch valve as it drops out	Motor - Use 6" adj. wrench	Component upper seat	Disassemble & identify component parts	
		8. Clean escapement valve with methyl chloroform				
		WARNING: Ensure at least two persons are in work area when using inhibited methyl chloroform	Motor - facility using dangerous solvents	Danger of prolonged contact with methyl chloroform	Handling of dangerous solvents and the requirements during use	
		9. Provide adequate ventilation	Organizational - Perceptual - detect when fumes are too strong	Location of ventilation switches - Danger of inhalation of methyl chloroform		

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean escapement valves MRC-L281 (Cont'd)	10. Inspect valve seat for nicks, dents & pits	Perceptual-Kinesthetic Look for nicks, dents feel for nicks, dents		Correct inspection procedures	
		11. Reinstall escapement valve				
		A Tighten valve seat into body using finger pressure only	Motor-Kinesthetic Tighten finger tight		Valve reassembly procedure	
		12. Loosen valve seat one flat or 1/6 turn	Perceptual-Motor	What flat means		
		13. Hold adjustment and tighten lock nut	Motor - Use 6" adj. wrench			
		14. Reinstall component cover				
		15. Open supply air valve				
	P/M Clean micro lock valves MRC-L283 1.0 hrs	The following P/M procedure applies to components listed.				
		1. Feedwater Controller				
		2. Steam/Feed Flow Totalizer				
		3. Drum Level Totalizer				
		4. Characterizing Relays				
		5. Air Flow Controller				
		6. Inverting Relay				
		7. Rate Relay				
		8. Toggle Relay				
		9. Set Point Controller				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled (Cont'd)	P/M Clean micro lock valves MRC-L283 1.0 hours (Cont'd)	1. Ensure controls are not in use	Perceptual & Memory - Evaluates gage indication to ensure control not in use	Acceptability of gage indications to ensure controls not in use	Identify gage indications and values that will indicate system is not in use	
		2. Assembles tools and materials A. Flashlite B. Lint free rags C. Allen wrench set D. 1/2 pint inhibited methyl chloroform	Organizational - removes tools from stowage	Identify hand tools	Assemble and inventory tools required	
		3. Remove component cover	Motor - Use Allen wrench to remove screws	Location of component		
		4. Shut component air supply	Motor - shutting valves	Location of air supply	Micro lock cleaning procedure	
		CAUTION: Do not alter micro lock adjustment or tamper with Allen head lock screw on side of valve mounting base		Location of adjustment and Allen head lock screw	Importance of leaving factory preset adjustments alone	All procedures will identify factory preset adjustments
		5. Remove valve & mounting base as a unit	Motor - Use Allen wrench to remove mounting screws	Location of mounting screws	Identify correct component parts	
		6. Clean micro lock valve & wipe dry	Motor -	Lint free rags should be used to wipe dry		
		WARNING: Ensure at least two persons are in work area when using inhibited methyl chloroform	Motor - facility using dangerous solvents	Danger of prolonged contact with methyl chloroform	Handling of dangerous solvent and the requirements during use	

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled (Cont'd)	P/M clean micro lock valves MRC-L282 (Cont'd)	7. Provide adequate ventilation	Organizational - Perceptual. Detect when fumes are too strong	Location of ventiliation switches - danger of inhalation of methyl chloroform	Handling of dangerous solvent and the requirements during use	
		8. Inspect valve seat for nicks & pits	Perceptual - Kinesthetic Look for nicks, pits Feel for nicks, pits		Correct inspection procedures	
		9. Reinstall valve and mounting base as a unit	Motor - Replace mounting screws using Allen wrench	Replacement location	Reinstallation procedure	
		10. Open component air supply	Motor	Location		
		11. Reinstall component cover	Motor - Use Allen wrench to replace screws			
	P/M Lubrience feed water flow control valve MRC L-283	1. Ensure boiler is secured	Perceptual - Memory Evaluates gage indications to ensure boiler not in use	Acceptability of gage indications to ensure boiler not in use	Identify gage indications and valves that will indicate boiler not in use	
	.2 hours	2. Assemble tools and materials A. Safety tags B. Hand oil can C. Wire - 24 ga D. 6" slip joint pliers E. 6" adjustable wrench F. Mason-Neilan No. 5 lube	Organizational - Remove tools from stowage	Identify hand tools	Assemble & inventory tools required	

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Lubrience feed water flow control valve MRC L-283 (Cont'd)	3. Wires feed stop valve shut	Motor-wires valve shut	Location of FD water flow control valve	Technique of safety wiring valves	
		4. Tags feedstop valve "DO NOT OPEN"		Information to be written on tag	Writing correct & complete information on tag and placing tags securely on valve	
		5. Carries out the tag out procedure	Organizational - Finding appropriate officers around ship to sign out the tag out sheets	Information required for filling out ships forms and which supervisors to turn it in to	Filling out ships tag out forms	
		6. Remove lagging pad	Motor - Unlace wire lacing		Proper removal and safeguard of lagging pads while job is in progress	
		7. Remove pipe plug from packing hand lubricator	Motor - Use adjustable wrench to remove plug	Location of plug		
		8. Fill lubricator until oil is even with bottom of plug hole	Perceptual - Motor Look in hole to see how full it is and put in oil			
		9. Reinstall pipe plug	Motor	Location		
		10. Reinstall lagging pad	Motor - Replace with 24 ga. wire		Proper lacing technique	
		11. Remove wire and safety tag from feed stop valve	Motor - Removes wire			
		12. Completes tag out procedure	Organizational - Finding appropriate officers around ship to sign out the tag out sheets			

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Blow Down Level XMTR Impulse Lines MRC-L284 .2 hours	1. Ensure controls are not in use	Perceptual - Memory Evaluates gage indications to insure control not in use	Acceptability of console & plant indications to assure control not in use	Identify gage indications & valves that will indicate syatem not in use	
		2. Ensure personnel are clear of drain	Organizational - Pass the word	Danger of high press. high temp blow down	Importance of safety during blow down	
		3. Begin shutting one cutout valve	Perceptual Motor - observe gage while manipulating valves	Location of cutout valve when equalization has tsken place	Equalize XMTRS	
		4. Open equalizing valve just before cutout valve is shut		Location of equalizing valve		
		5. Completely close 1st cutout valve then close remaining cutout valve		Location of 2nd cut out valve		
		6. Open blow down drain valve	Motor	Location of drain valve		
		7. Continue to blow down until vapor appears at drain	Perceptual - Vapor must be "dry" vapor			
		8. Shut down blow down valve when lines are clear of water	Motor - Perceptual	Location	Correct Blow Down Technique	
		9. Allow linea to fill with condensate & cool to the touch	Kinesthetic - Discriminate between hot & cold by touch		Frame of reference for what is cool in a fire room	
		10. Crack open lat cutout valve and start to shut equalizing valve	Motor	Location		

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Blow Down Level XMTR Impulse Lines MRC-L284 (Cont'd)	11. When equalizing valve is completely shut open 1st cutout valve fully	Motor Perceptual - Observes gage while manipulating valves	Location		
		12. Open 2nd cut out valve	Motor	Location		
		13. Return control to operator	Organizational			
	P/M Blow Down Feed Flow MXTR Impulse Lines MRC L-285 .2 hours	Procedure Same as L-284				
	P/M Blow Down Steam FLow XMTR Impulse Lines MRC L-286 .2 hours	Procedure Same as L-284				
Scheduled	P/M Test Operation of Air Lock System MRCS-825 .2 hours	1. Ensure controls are not in use	Perceptual - Memory Evaluates gage indications to ensure control not in use	Acceptability of console & plant indications to ensure sys. not in use	Identify gage indications & valves that will indicate system is not in use	
		2. Ensure air supply system is pressurized	Perceptual - Memory Evaluates air supply gage to determine full system press 65 psi	Location of air supply gage. System press set point	Set up of console to test air lock system	Purpose of this test is to determine that fuel, air & water will "Fail as is" on loss of supply air

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled (Cont'd)	P/M Test Operation of Air Lock System MRCS-825 (Cont'd)	3. Shut air supply valve	Motor	Location of air supply valve	Air lock test procedure	
		4. Observe toggle relay	Diagnostic - Observe relay movement - observe gage	Relay should trip at 60 psi. Air lock header pressure 0 psi	Recognize when relay has tripped	
		5. Observe following components to insure signals are locked in. 1. Fuel oil return control valve 2. Forced draft blower control valve 3. Feed water flow control valve	Perceptual & Memory Note what pressures were before and after pneumatic transfer valve actuates	Pneumatic trans valve should lock in signals	Recognize signals before & after	
		6. Open air supply valve and presaurize system	Perceptual motor open valve observe gage	System press should be 65 psi	Value of full sys. press	
		7. Reset air lock system a. Pull air lock release knob b. Hold open until control air pressure & air lock preasure are equal	Perceptual Motor Pull air lock release knob on console	System Pressure must be above 60 psi before air lock can be reset	Reset Procedure	

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EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean & Inepect Air Preeeure Reducing Valves & Y Type Strainere MRC L-288 .5 hours	1. Assemble toole & materials A. Rag lint free B. Safety tags C. Wire 24 ga. D. 10" pipe wrench E. Soft bristle brush F. 8" adj. wrench G. 6" slip joint pliers H. 1/2 pint inhibited methyl chloroform	Organizational - Remove tools from storage	Identify hand tools	Assemble & inventory tools required	
		2. Wire inlet & outlet velves shut	Motor - Safety wiring valves using slip joint pliers	Location of inlet and outlet valves	Technique of safety wiring valvee	
		3. Tag inlet & outlet valvee "DO NOT OPEN"		Information to be written on tag	Writing correct & complete information on tage and placing eecurely on valve	
		4. Carries out tag out procedure	Organizational - Finding appropriate officers around ship to sign out tag out form	Information required for filling out ship's forms and which supervisors to turn it in to	Filling out ships tag out forms	
		5. Secure air eupply to reducing velve	Motor	Location of air supply		
		6. Loosen lock nut and relieve compression on epring	Motor Perceptual Relieve compression while looking at epring	Component Parts	Demounting procedure for reducers	

EVENT	SYS. OPER.	TASKS	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
Scheduled	P/M Clean & Inspect Air Pressure Reducing Velves & Y Type Streiners MRC L-288 (Cont'd)	7. Remove valve from piping system	Motor - Use 10" pipe wrench to loosen couplings			
		8. Clamp valve body in vice with set screw end down	Motor - Kinestheric Clamp with just enough pressure to hold but not to damage valve body	Location of vice	Use of vice	
		9. Remove cap plug holding valve assembly	Motor - Use 8" adj. wrench	Component Parts	Disassembly Procedure	
		10. Remove spring & valve assembly by turning velve upset down	Motor	Component Parts	↓	
		11. Flushout valve body with methyl cloroform WARNING: Ensure et least two persons are in work area when using methyl cloroform	Motor - Fecility using dengerous solvents. Use soft brush	Denger of prolonged contact with methyl cloroform	Handling of dengerous solvents and requirements during use.	
		12. Provide adequete ventilation	Organizational - Perceptual Detect when fumes are too strong	Danger of inhalation of methyl cloroform Locetion of ventilation switches		
		13. Inspect valve for excessive weer	Diagnostic	What is excessive wear		
		14. Inspect composition washer pressed in top	Diagnostic	As ebove		

EVENT	SYS. OPER.	TASKS	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
		15. Replace spring & valve assembly	Motor	Component Parts		
		16. Replace cap plug	Motor - Use 8' adj. wrench	Component Parts	Reassembly procedure for air reducers	
		17. Reinstall valve body in air supply piping	Motor - Use 10" pipe wrench		↓	
		18. Clean Y type strainer	Motor - Use 8" adj. wrench	Location	Y strainer procedure	
		A. Remove strainer plug				
		B. Remove strainer basket				
		C. Clean strainer basket	Use soft brush			
		D. Inspect strainer basket	Perceptual - Look for breaks & tears			
		E. Reinstall strainer basket				
		F. Reinstall strainer plug				
		19. Remove wire & safety tag	Motor			
		20. Open air inlet & outlet valves	Motor			
		21. Inspect for leaks				
		A. make up soap solution	Perceptual-Consistency of soap solution		Proper technique for soap test of fittings	
		B. applies soap solution to fittings	Motor	Indication of leaks		
		22. Adjust reducing valve output pressure	Perceptual-Motor Turn adjusting screw while observe press. gage	System pressure		

EVENT	SYS. OPER.	TASKS	SKILL	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Clean & Inspect Air Pressure Reducer Valves & Y Type Strainers MRC L-288 (Cont'd)	23. Tighten lockout when correct pressure is set	Motor		Adjusting pressure reducing valves	
Scheduled	P/M Test Fuel Oil Control Valve Minimum Setting MRC W-868 1.0 hours	1. Assemble tools & materials A. Rags B. Dedwercht tester (?) C. 6" slip joint pliers D. 10" adjustable wrench	Organizational - remove tools from stowage	Identify hand tools	Assemble & inventory tools required	
		2. Calibrate fuel oil pressure gage	Perceptual - Motor Observe gage while loading dead weight tester	Gage calibration procedure	Objective covered in Corr. Maint	Procedure given as a standard calibration process in corrective maintenance
		3. Have operator lineup and operate F.O. system	Organizational			
		4. Shut system air inlet valve	Motor	Location of air inlet valve		
		5. Release air lock and reduce diaphram loading pressure to zero	Motor - Perceptual Observe gage as pressure goes to 0	Location of air lock release	FO control Valve Calibration procedure	Covered in detail in Corr Maint
		6. Remove spring barrel cap & cotter pin	Motor	Component Parts		

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EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Test Fuel Oil Control Valve Minimum Setting MRC W-868 (Cont'd)	7. Loosen locknut	Motor	Component parts		
		8. Adjust by turning slotted stem	Motor - Perceptual Turn stem while observing FO press gage	Component parts with Diaphram air pressure at 0 fuel oil pressure should be 4 psi		
		9. Hold adjustmert & tighten locknut	Motor			
		10. Reinstall cotter pins and spring barrel cap	Motor			
		11. Open system air inlet valve	Motor	Location		
		12. Reset air lock system	Motor	Location of reset		
		13. Have operator secure FO service system if nut required for service				
Scheduled	P/M Test Entire System for Air Leaks MRC L-291 1.0 hours	1. Assemble tools & materials	Organizational - Removes tools from stowage	Identify hand tools	Assemble & inventory tools required	
		A. Rags				
		B. Water				
		C. Bucket				
		D. Flashlite				
		E. Liquid soap				
		F. 1" paint brush				
		G. 6" adjustable wrench				
		H. 8" screw driver				
		I. 3/8" 1/2" 9/16" open end wrenches				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Test Entire System for Air Leaks MRC L-291 (Cont'd)	2. Ensure boiler is secured	Perceptual - Memory Evaluates gage indications to ensure boiler is not in use	Acceptability of console & plant indications to indicate boiler not in use	Identify gage indications and values that indicate boiler not in use	
		3. Ensure 65 psi air pressure being supplied to system	Perceptual - read gage	What system press should be	soap test procedure	
		4. Remove access panel from front and back of console	Motor - open latches remove screws			
		5. Place control sys. in remote manual a. Increase manual loading pressure to max.	Perceptual - Motor turn auto/man selector knob to man. observe auto loading gage decrease to 0. Turn man reg knob to main increase	Location of controls		
		6. Mix soap and water	Perceptual - Motor consistence of soap solution			
		7. Apply soap solution to fittings	Motor - Perceptual Observe for bubbles	Indications of leaks		
		8. Correct leakages	Motor - tighten fittings			
		9. Wipe previously soaped fittings dry	Motor - Memory Use rags to wipe up soap residue on all fittings	What fittings have been tested	Lesve under psnel clean & free of sosp residue	

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Test Entire System for Air Leaks MRC L-291 (Cont'd)	10. Decrease manual loading pressure to zero	Perceptual - Motor Turn manual reg knob to max decrease observe man loading gage decrease to zero	Location	Leave console in unloaded condition	
		11. Reinstall access panels	Motor			
	P/M Renew Stuffing Box Packing in Feed Water Flow Control Valve MRC - S827 .5 hours	1. Ensure boiler is secured	Perceptual - Memory Evaluates gage indications to ensure boiler is not in use	Acceptability of console & plant indications to indicate boiler not in use	Identify gage indications & values that will indicate boiler not in use	
		2. Assemble tools and materials A. Safety tags B. Flashlite C. Wire brush D. Wire 24 ga. E. 6" slip joint pliers F. No. 1 packing puller G. 1/2" combination wrench H. 8" screw driver I. 1/4" packing symbol 1433 or Teflon equivalent J. Knife	Organizational - Remove tools from stowage	Identify hand tools	Assemble and inventory tools required	
		3. Wires feed stop valve shut				

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Renew Stuffing Box Packing in Feed Water Flow Control Valve MRC - S827 (Cont'd)	4. Taga feed stop valve do not open				
		5. Carries out tag out procedure				
		6. Remove packing gland	Motor - Use 1/2" wrench to remove packing gland nuts	Component parts		
		7. Remove old packing	Motor - Use packing puller to remove packing and lots of patience	Repack procedure for valves. Correct use of packing pullera.		
		8. Remove lubricator ring	Motor - Use package puller to remove ring	Component parts		
		9. Remove remainer of packing under lubricator ring	Motor -			
		10. Clean stuffing box and stem	Motor -			
		11. Inspect stem for scoring	Perceptual - Kinesthetic Lock at stem to detect scoring - feel it		Results of stem scoring on packing. What is acceptable scoring.	
		12. Clean packing gland studs	Motor - Use wire brush	Component parts		
		13. Measure packing around stem and cut 8 ringa to length	Perceptual - Motor measure and cut	Component parts	Methods of Cutting packing butts	
		14. Install 2 rings of new packing	Motor	Butts must be staggered	Method of inserting packing	
		15. Reinstall lubricator ring	Motor	Component parts		
		16. Install 6 rings of new packing	Motor	Butts must be staggered		

EVENT	SYS. OPER.	TASKS	SKILLS	KNOWLEDGE	TRAINING OBJECTIVE	COMMENTS
	P/M Renew Stuffing Box Packing in Feed Flow Control Valve MRC - S827 (Cont'd)	17. Reinstall packing gland and hand tighten nuts 18. Lubricate packing gland as per MRC L-283 19. Remove wire & safety tag from feed stop valve 20. Complete tag out procedure	Motor - Kineathetic Hand tighten nuts			At first opportunity with plant in operation tighten packing to stop leakage