The Demining Support System:
Worldwide Analysis and Assessment

Contents

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Part I: Background

Background of the Humanitarian Demining Research and Development Program

In 1995 the United States Department of Defense began to initiate research and development into cost-effective demining technologies. The Humanitarian Demining (HD) Program at Night Vision and Electronic Sensors Directorate (NVESD), Fort Belvoir is involved in developing, testing and evaluating technologies to:

- clear, detect, mark and map landmines
- protect individual deminers
- clear vegetation
- promote mine awareness

This program also leverages technology from other organizations and uses commercial off-the-shelf technology whenever possible for rapid development and field assessments.

The goals of the HD program are to provide suitable technology to detect and clear all landmines, improve operator safety and provide special small and hand-held tools for operators.

Orientation of the Demining Support System

The Demining Support System (DSS) supports the NVESD goal of promoting mine awareness and demining training. It was designed to be shipped to the host nation and utilized by the U.S. Army Special Operations Forces (SOF) who establish and support demining and mine awareness programs, and conduct demining training for indigenous

personnel. The DSS, an electronic performance support system, was created for use as a demining instructor's workstation for the development and production of classroom and field training materials in demining, medical, mission planning, and mine awareness, and as a platform for delivering classroom presentations. It is made of multi-lingual and multi-media audio visual equipment that provides computer-aided training resources. The DSS addresses the flexibility and training consistency needs identified in the requirements analysis phase of system development by:

- providing information at the moment of need (Just-In-Time Training)
- modeling, structuring, and implementing support electronically
- making the training universally and consistently available on demand anytime, anyplace, regardless of the situation
- conveying the message in the presentation mode best suited to the target audience
- offering an integrated package of previously independent resources

The first DSS prototype was delivered to the Office of Special Technology in December 1995. Version DSS 2 was completed in December 1996. The first field deployment was in February 1997 to Bosnia and DSS 3 was completed in June 1998. Currently there are three DSSs deployed in the U.S. and ten overseas. Tables 1-3 below show the differences among the versions of DSSs developed, and the countries and types of organizations that have the DSS.

Table 1: Hardware and Software Packages Available on Various Versions of the DSS

Hardware and Software Packages	Versions of DSS		
	DSS2	DSS2 Upgrade	DSS3
Hardware			
Computer	Ruggedized laptop	Ruggedized laptop	Built-in computer, plus keyboard & monitor
Screen/monitor	CRT touch screen monitor (not ruggedized)	CRT touchscreen monitor (not ruggedized)	• Touch screen flat panel display, ruggedized • Computer monitor
Hard drive	1.2GB (internal)	1.2GB (internal)	6.4GB or higher

Hardware and Software Packages	Versions of DSS		
	DSS2	DSS2 Upgrade	DSS3
Hardware			
	+3GB (external)	+3GB (external)	
Internal modem			X
CPU speed	166MHz	166MHz	200MHz / 233MHz / 300MHz
Memory (RAM)	32MB	32MB	64MB or more
Dual speakers	X	X	X
Power conditioner	X	X	X
UPS			X
Poster printer	Encad NovaJet4	Encad NovaJet4	Encad Novajet4 or Encad CromaJet4
Small color printer	Canon BJC-70	Canon BJC-70	Canon BJC-80
Digital camera	Kodak DC40	Kodak DC40	Kodak DC50 or DC210
Scanner	Logitech PageScanner	Logitech PageScanner	Logitech PageScanner or Paperport Scanner
Heat press	X	X	Same model, different look
Transport cases	4	4	5
Software			
Logitech scanner software	X	X	X
Kodak DC40 software	DC40	DC40	DC40
Content manager		X	X
MineFacts	X	X	X
Orbis 1.0			X
Poster software	X		
PowerPoint poster program		X	X
Office 95	X (only in Bosnia, Honduras/Nicaragua, Rwanda)		
Office 97	X (all except the above countries)	X	X
Windows 95	X	X	X
Windows 98			X*

*DSS3s have either Windows 95 or 98.

Table 2: Location of Various Versions of the DSS

Deployment sites	Versions of DSS		
	DSS2	DSS2 Upgrade	DSS3
Bosnia & Herzegovina	3		
Camp Pendleton, CA		1	
Fort Leonard Wood, MO	1		
Germany		1	
Guatemala			1
Honduras / Nicaragua (in future possibly)	1		
Jordan	1		
Laos	1		
New Zealand	1		
Rwanda	1		

Table 3: Description of the Locations of the DSSs

Deployment sites	Military engineering school	Military demining organization	Regional demining organization	Multilateral military demining school	Regional commercial demining company	National public demining organization
Bosnia & Herzegovina					X	
Camp Pendleton, CA		X				
Fort Leonard Wood, MO	X					
Germany				X		
Guatemala			X			
Honduras / Nicaragua*			X			
Jordan	X					
Laos						X
New Zealand	X					
Rwanda		X				

*This system has been transported between Honduras and Nicaragua for use by an NGO that changes its operations location regularly.

Description of Training Offered on the DSS

Following each DSS deployment, a DSS technical team arrived at the DSS location, assembled it and performed a functions check, resolved problems resulting from shipping, then conducted approximately three days of training. In a few cases, DSS users

were trained at Fort Belvoir, VA before receiving their DSS. When it arrived on site, users performed the tasks they had learned to make the DSS operational.

System training lasted approximately three days. The trainer explained tasks, showed the users how to perform them, then allowed users to try tasks. This part of the training was normally accomplished in the first day or day-and-a-half. Once the user was familiar with the system as a whole, the remaining time was used to show the user how to perform user-selected specific job tasks. Training consisted of the subjects listed in Table 4.

Table 4: Description of DSS User Training

Topic	Subtopic
Introduction to the DSS	--
Disassembling the DSS	--
Assembling the DSS	--
Overview of the DSS Menu	--
Playing Video and Operating the Speakers	--
Poster Printer	▪ Setting up the Poster Printer ▪ Explanation of Ink Cartridges and Refill Ink ▪ Care and Loading of Poster Paper ▪ Priming Ink ▪ Calibrating the Poster Printer ▪ Making Posters using the Software ▪ Printing Posters ▪ Maintenance and Troubleshooting
Portable Printer	▪ Explanation of Ink Cartridges and Ink Tanks ▪ Loading Paper, Index Cards, and T-shirt Transfers ▪ Conducting Print Tests ▪ Cleaning Print Cartridges ▪ Changing Cartridges ▪ Changing Ink Tanks ▪ Printing Black and White Documents ▪ Printing Color Images ▪ Printing T-shirt Transfers ▪ Maintenance and Troubleshooting
Digital Camera	▪ Taking Pictures ▪ Transferring Images to the Laptop Computer

Topic	Subtopic
	▪ Improving the Images by Example ▪ Saving Images ▪ Inserting Images in Posters
Scanner	▪ Setup ▪ Calibration ▪ Optical Character Reading ▪ Image Scanning
Touchscreen	▪ Using ▪ Calibrating
Heat Press	▪ Setting Up ▪ Pressing Transfers ▪ Packing
Practical Use of the DSS	▪ The DSS trainer worked with the user to find out what tasks they need the DSS to perform in their everyday jobs, then showed them how to perform those tasks.

Background of the Evaluation Process

In 1999 the DSS assessment team was tasked to conduct an assessment of the DSS to understand how it is being used, the needs it is meeting, those needs it could better meet, and the users' impressions of the DSS's strengths and weaknesses. It was determined that face-to-face interviews would be the most thorough way to gather data. In addition, an onsite visit would best show the team how the DSS was being used.

The interview guide (see Attachment B, Field Assessment Interview Guide) used to conduct the interviews ensured that the same type of data would be collected across all interviews. The interviews were conducted by two people. One person was the lead interviewer, while the other took notes and added questions. The two interviewers changed roles regularly, so that the lead interviewer became the notetaker, and vice versa. The interviews lasted approximately one and one-half to three hours for each interviewee. Prior to the interviews, we faxed the contact person at each location a questionnaire (see Attachment A, DSS Field Assessment Questionnaire). Table 5 shows the number of questionnaires returned by each site.

Table 5: Questionnaires Returned

Deployment sites	DSS Questionnaires Returned
Bosnia & Herzegovina*	3
Camp Pendleton, CA	1
Fort Leonard Wood, MO	1
Germany	1
Guatemala	0
Honduras* / Nicaragua	1**
Jordan	2
Laos	3
New Zealand	0
Rwanda	0
TOTAL	**12**

*These sites were not visited by the assessment team.

**A partial questionnaire was faxed to us by Scott Getter of Southcom. He had interviewed a Brazilian, Major Medina, in Honduras who had used the system an average of 2-3 times per month.

Once we received the returned assessment questionnaires, we tailored the interview guide to incorporate the respondents' replies. The interview guide is divided into five sections. In the first section we briefly explained the purpose of the interview and an overview of the interview structure. In the second section we asked a few questions about the interviewee's training, demining and computer experience, the training he received on the DSS, and general questions about how he uses the DSS. The third section was a group of questions covering the context in which the DSS is used. This section required the interviewee to cite many examples of usage. The fourth section of the interview guide consisted of more direct questions. This included questions on the specific lessons he uses (demining training modules, medical training modules and mine awareness modules), other software used with the system, general training questions, transporting and assembling the machine, and questions on the hardware components of the system. In the final section, we had the interviewee sit in front of the DSS and demonstrate how he uses the system. The interviewers noted such details as unexpected uses of the system, "workarounds" that had been developed, points of confusion, false starts, etc.

After our trip to Jordan, we revised the interview guide. Some questions that had caused confusion were either reworded or eliminated. In addition, during the interview we asked the interviewee to indicate which lessons or videos had been used. Questions about use

of the lessons were moved to an earlier section of the interview guide in order to ensure collection of this data.

Part II: Findings

Overall Use of the DSS at Each Site

At each site the interviewees used the DSS mainly as a workstation because they have limited computer resources. They tended to use the hardware components of the DSS much more than the training packages. MineFacts was the most used feature of the DSS.

Most users are very computer literate and handle the trouble shooting issues that are involved with their DSS. There is usually one designated person responsible for the DSS for their organization, and the other instructors go to them to get items created and printed.

Table 6 provides an overview of users interviewed at each site. Most of the information displayed in the table was collected through the interview process described earlier in this report. However, no trip was made to Bosnia; users provided their feedback through the questionnaires. In addition, the technical assessor and government project manager traveled to Laos, but the interviewer team did not; feedback from Laotian DSS users was collected by the government project manager during his visit.

Table 6: Overview of DSS Users

Deployment Sites	Organization	Number of Users Interviewed	How Long in Current Position	Frequency of DSS Use
Bosnia & Herzegovina	RONCO	0	▪ 2 years ▪ 2 years ▪ 3 years	▪ >1 time/week ▪ 1 time/month ▪ rarely
Camp Pendleton, CA	Marine Corps base	2	▪ almost 1 year ▪ 9 months	▪ 1-3 times/week ▪ 2-3 times/month

Deployment Sites	Organization	Number of Users Interviewed	How Long in Current Position	Frequency of DSS Use
Fort Leonard Wood, MO	U.S. Army Engineering School, Countermine Training, SPT and Humanitarian Demining Team Center	5	▪ 2 years ▪ 3 years ▪ 3 years ▪ 15 months ▪ 7 months	▪ Several times/year ▪ 1-2 times/month ▪ Regularly ▪ -- ▪ -- (used it 2-3 times/week in NZ)
Germany	Euro NATO Training Engineer Center (ENTEC)	2	▪ 3 years ▪ 1 year	▪ 1 time/week ▪ 1-2 times every 2 weeks
Guatemala	Office of Demining Assistance Program in Central America (PADCA)	4	▪ 2 years ▪ 11 months ▪ 5 years ▪ 9 months	▪ ~3 times/week ▪ -- ▪ -- ▪ --
Honduras / Nicaragua	Mission of Assistance for the Removal of Mines in Central America (MARMINCA)	2	▪ 1 year ▪ 5 months	▪ 2 times/month ▪ Twice/5 months
Jordan	Royal Corps of Engineers School	2	▪ 2 years ▪ 8 months	▪ >1 time/week ▪ >1 time/week
Laos	UXO Lao	3	▪ ~6 months ▪ 2 years ▪ 6 months	▪ rarely ▪ >1 time/week ▪ >1 time/week
New Zealand	School of Military Engineering	3	▪ 3 years ▪ 15-16 years ▪ 1.5 years	▪ 2 times/month ▪ 1 time/month ▪ --
Rwanda	National Demining Office (NDO)	2	▪ 2-3 years ▪ 2 years	▪ 3-4 times/month ▪ 1 time/week

Feedback about Training Received on the DSS

Users who had received DSS training from Fort Belvoir or Essex/Star Mountain staff
were found at all locations except for Nicaragua. Since personnel at the Mission of
Assistance for the Removal of Mines in Central America (MARMINCA) in Nicaragua
are in their positions only one year, someone had probably received DSS training and had

already left the organization. Users in Jordan, New Zealand, at Camp Pendleton, and at the Euro NATO Training Engineer Center (ENTEC) in Germany were generally satisfied with the user training they had received. Prior computer experience was important, in the opinion of several users. A user at Camp Pendleton believed he would have had a problem using the DSS without his previous software experience; he recommends basic software training in Word, PowerPoint, and Excel for system users who lack this experience. In addition, an instructor in New Zealand thinks his lack of computer knowledge made it harder for him to retain what he had learned, therefore he recommends that people who are trained to use the DSS should use it frequently so that they do not forget anything.

Other users commented that the training they received could have been improved. Users in Rwanda, Guatemala and Bosnia said they would have preferred more extensive training and practice. Users at Fort Leonard Wood did not receive a thorough introduction to the DSS. Initial training was given about six months after the system was shipped and lasted only one day due to inclement weather. There was at least one additional follow-up visit to Fort Leonard Wood to provide additional training. The user in Rwanda also found the training challenging because it was given in English, a language that he knows only somewhat. Users in Guatemala had translated the User's Guide into Spanish so more people could use it for reference.

Some of the users' suggestions for improving the training and supporting user know-how following the training include:
- More maintenance guidance (Jordan)
- Emphasize trouble-shooting and solving minor problems (Guatemala)
- Include troubleshooting "cheat sheets" to help the user through certain processes (New Zealand)
- Have "cheat sheets" to help get into the lesson plans, print posters, download images from the digital camera, and boot up into MineFacts (Fort Leonard Wood)

- Include basic "help tutorials" on, for example, how to change images when you have to convert them, how to put images in a folder and how to use the folder (New Zealand)
- Include information on how to load software (New Zealand)
- Include information on default settings so that users can return components to their original configuration (New Zealand)
- Include handouts with the hands-on training (Fort Leonard Wood)
- Make the User's Guide easier to read and include more images rather than text -- in other words, have it show what happens when you do this, what it is supposed to do (Fort Leonard Wood)
- Reinforce sections of the User's Guide on the scanner and poster printer (Fort Leonard Wood)
- Add more practical solutions to problems in the User's Guide (Bosnia)
- More detailed training on the Content Manager (Camp Pendleton)
- Explanation of the lessons and how they should be used (Guatemala)

Users in New Zealand, Rwanda and Fort Leonard Wood trained some of their colleagues to use it. In New Zealand and Rwanda the training focused only on using some components. For example, in New Zealand a user trained his colleague to set up the system, play the main video and use the plotter. Another user trained a colleague to use the plotter and tee shirt press. A trainer in Rwanda learned from his colleague a few things about the DSS, including how to turn it on and use MineFacts. However, he did not learn how to connect the poster printer or heat press, how to use the scanner or digital camera. At Fort Leonard Wood several people learned how to use the system and then helped one another when there were problems.

How the DSS is Used

How the DSS helps users in their jobs is summarized in Table 7.

Table 7: Overview of How the DSS Helps Users in Their Jobs

Deployment sites	How DSS Helps Users in Their Jobs
Bosnia & Herzegovina	--

Deployment sites	How DSS Helps Users in Their Jobs
Camp Pendleton, CA	They have used it to prepare posters and handouts for class. Having the DSS has decreased by half the time it takes to plan for a class. The DSS has made their job a lot easier and has made it more interesting for the learner.
Fort Leonard Wood, MO	Used to prepare some training materials (some lessons, handouts), and for MineFacts. Recently, it has been just another computer for them to use.
Germany	Just another tool for them, and the users prefer most other tools they have to the DSS. They have many other sources of information and other hardware components; the poster printer is the most helpful feature of the DSS.
Guatemala	Helpful for preparing for and presenting training.
Honduras / Nicaragua	Use MineFacts to train new incoming MARMINCA demining supervisors on the types of mines that are found and manufactured in Central America and to print materials for trainees.
Jordan	Use the DSS often for creating demining training aids, mine awareness materials and for conducting demining classes. They appreciate having the DSS at the school.
Laos	- Information on mines – where it is manufactured, material it is made from, and its size (MineFacts?) - Used with some database applications to keep track of their UXO removal operations for the entire country
New Zealand	The DSS is another tool for them to create training materials, and another computer for their staff.
Rwanda	The DSS is useful for them as a source of information, particularly MineFacts.

▪ **DSS Functions**

MineFacts is the most-used function on the DSS, followed by demining training. MineFacts is used to create training aids that give an overview of mines that may be encountered in a certain area, or to identify mines that have been found (Rwanda). Rwandan deminers have found that MineFacts has been a very valuable tool in identifying mines and, in turn, supporting their survey and clearance operations.   Many of the users use the MineFacts CD on their own desktop computer, especially if they have

their own components such as a color printer or poster printer connected to the desktop. Interviewees frequently compared MineFacts to the Canadian Forces School of Military Engineering (CFSME) Landmine Database. One person thinks MineFacts is concisely written, has good images, and covers 99% of what is in the CFSME mine database. Another believes it has a good search function and search criteria (such as size, shape, color, and material). In addition, the fact that the images are not incorporated into a database makes them easier to extract when creating a poster.

Users also had suggestions for improving MineFacts. These needs are summarized in Table 8.

Table 8: MineFacts (MF) Needs

Deployment sites	Add more entries	Add more categories	Add more details to each entry	Mine images
Germany	Estimate 50-80 mines not included	MF should include: ▪ Scatterable munitions ▪ Bombs ▪ UXO ▪ Homemade mines	▪ Give complete mine measurements ▪ Include mine identification numbers ▪ Include render safe procedures (available by password only)	Include images of cross sections
Jordan	10% of mines found in Jordan not in MF			
New Zealand			Include how to detonate a mine	▪ Include more realistic photos ▪ Include option to print multiple images on one page
Fort Leonard Wood, MO	X			

Three users in Fort Leonard Wood, Jordan, and Germany think it needs to be updated; one user in Jordan said that 10% of the mines they have found are not covered in it, and an instructor at Germany estimates that about 50-80 mines are not included. In contrast, another found that MineFacts lacks detail and gives incomplete measurements (e.g., sometimes it gives width but not length). This user finds the CFSME database more user-friendly. He would like MineFacts to integrate scatterable munitions, bombs, and UXO. Also, it should allow users to add entries to it.   The same user's colleague believes home made mines should be included, as well as additional details such as images of cross sections, mine identification numbers, and render safe procedures. He believes the procedures, however, should only be provided by password to those who have received proper training. A user in New Zealand prefers the CFSME database because it shows how to detonate a mine, the mines look more realistic, and multiple mines can be printed on one page.

The demining training is used somewhat at several locations. Users in Bosnia have used the demining training to create materials and to conduct training. Two users at Fort Leonard Wood, MO, found the probing lesson very helpful in putting together lessons, and one of them also used the lesson on tripwires. In Jordan, the instructors planned to have all the lessons translated into Arabic; they expected the materials would be used much more frequently after the translation. Following the trip to Jordan, we put together a table listing all the demining and medical lessons on the DSS and showed it to interviewees to get more feedback about the lessons' use, as time permitted. Results for Germany, Rwanda, and Fort Leonard Wood are in Table 9.

Table 9: Demining Lessons Used or Reviewed at DSS Sites

	Ft. Leonard Wood	Germany	Rwanda
Identifying Mines in Bosnia		X	
Identifying Likely Mined Areas		X	X
Visually Detecting Mines in Likely Areas		X	
Marking Mines and Tripwires	X*	X	

	Ft. Leonard Wood	Germany	Rwanda
Marking, Recording, and Reporting Minefields		X	
Directing a Demining Team		X	
Identifying UXO		X	X
Locating Tripwires	X*		X
Locating Mines by Probing	X		X
Locating Mines using the Mine Detector			X
Demolition Safety			X
Priming Explosives Nonelectrically			X
Priming Explosives with a Det Cord			X

*Either one or both of these lessons on tripwires was used.

In Jordan, an instructor has used the videos for probing and tripwires.

In Germany, an instructor has used the lessons for input and not as a lesson planning aid.
In Rwanda, an instructor had created his own training based on the DSS demining
materials; however, he did not have the materials available to show us.
At Germany and the School of Military Engineering at Palmerston North, New Zealand,
users said the demining training would be much more useful if it incorporated U.N.
training standards and policies, which they use. Ironically, one instructor at Fort Leonard
Wood said she has gone into some of the demining training to edit it to U.S. Army
standards, which are less stringent than the U.N. standards "reflected in the lessons."
Another instructor at Fort Leonard Wood said he had used the demining lessons but
stopped once they became outdated.

The DSS is occasionally used for mine awareness purposes. The mine awareness
materials are used the most in Jordan, more than demining and medical training content.
Users create materials for their mine awareness program and prepare to train mine
awareness. In fact, the trainers had recently created a brochure using the DSS. An
instructor in Germany makes posters to take with him to Denmark to conduct mine
awareness training to soldiers, and a New Zealand instructor has created tee shirts to

promote mine awareness. Another New Zealand instructor requested several times to use the system to conduct mine awareness training on the South Island, but his colleagues did not want to ship it to him for fear of damaging it. Users in Bosnia have used the mine awareness materials to create training materials and to conduct mine awareness training. Many users believe the DSS would help support a mine awareness program by using it to make posters, t-shirts, handouts and stickers (Fort Leonard Wood, Guatemala, New Zealand). Users thought it would be invaluable to take the system on the road to show mine awareness videos and slides, and to prepare for training and produce materials (New Zealand, Rwanda, Fort Leonard Wood). However, those who have mine awareness programs have their materials created and manufactured elsewhere. In Rwanda a subcontractor produces posters, backpacks, t-shirts, caps, brochures, and banners. Guatemalan firefighters distribute t-shirts, caps, bags and posters with the demining logo; these are not created with the DSS. Even the Jordanians resorted to a local print shop to print their mine awareness brochures. In all locations but Jordan, the DSS helped with mine awareness through the hardware components, not through the images provided with the DSS.

Among the functions on the DSS that are the least used are Content Manager and the medical lessons. Content Manager was on the systems at Camp Pendleton, in Germany and Guatemala and was seldom used. In Germany one user thought it would be good for non-computer users. However, since he is comfortable with computers, he uses Windows Explorer instead. At Camp Pendleton users found Content Manager redundant -- an extra step was needed to save the file. First they had to save the file in PowerPoint, for example, and then again in Content Manager, to use it in the DSS. Nonetheless, they plan to use Content Manager "heavily" to add four Periods of Instruction (POI) on transportation, communication, mine detection, and UXOs; these are currently in paper form in binders.

The reason the medical lessons are not used is that medical skills are usually taught elsewhere by specially trained medical personnel, not at the sites where the DSS is located. Users at Camp Pendleton reported that medical training is provided by the

medics that go in-country with them or through the Navy. Medical training is provided by the National Demining Office in Kigali, Rwanda, but the doctors who provide the training are not familiar with computers. The New Zealand Army provides medical training in Christchurch; one interviewee did not think the medics knew that the School of Military Engineering in Palmerston North had the DSS with medical videos. In Nicaragua, trainees receive medical evacuation procedures, among other information; however, we did not learn who assembled the information. According to two instructors in Germany, each host nation provides its own medical training. All soldiers learn first aid in basic training. The medical videos are viewed but are not used for training. Some "gross" videos are used at Fort Leonard Wood to capture trainees' attention. Users in Bosnia report using medical training content less than demining and mine awareness training. Only at Fort Leonard Wood did someone report using specific lessons. An instructor said that she uses the first aid lesson and its images and casualty evacuation lessons to prepare to teach.

Users also had feedback about the word processing and presentation software included on the DSS. Users in Rwanda prefer WordPerfect to Word and recommend including that software. In addition, PowerPoint is limited in its ability to manipulate graphics, according to some users, and should be replaced by a graphics software with expanded capabilities such as Micrografx Picture Publisher (Camp Pendleton) or Photoshop (Fort Leonard Wood).

Some users found the Kodak software that came with the digital camera troublesome. One user in Germany said that it needs to be easier to change the format of photographs. Two users at Fort Leonard Wood reported that they could not enlarge photos to the size they wanted, and that it was hard to download images and manipulate them into different sizes.

- **DSS Hardware Components**

In general, the components are used for intended purposes. Following is a description of how the poster printer, small printer, digital camera, scanner, heat press, touch screen monitor, speakers, and cables are used and feedback by the users.

The poster printer is the most used hardware component and is used to create training aids that depict:

- mines
- photos taken by the digital camera
- mine awareness images
- scanned-in images
- equipment (demolition equipment such as safety fuse and blasting caps, other demining equipment)
- bridges

At the locations where it was seldom or never used, the reason was that a better, easier-to-use, or more powerful one was available (such as at Fort Leonard Wood and in Germany), users did not know how to plug it in and use it (Rwanda, New Zealand), or two people are needed to unload it from its case (New Zealand). Some criticisms of the poster printer were that it is slow to use, the colors do not match computer screen colors (Jordan) and the resulting printout is of poor quality (Germany).

The small printer was also among the most used components. The small printer is used to print:

- images of mines from MineFacts
- other images that came with the training materials, were scanned in, or were photographed
- handouts
- stickers
- index cards for instructors to use in the classroom
- brochures
- reports

- identification badges
- lesson plans
- other training aids

However, users had several complaints about the printer: it is slow to operate (Jordan, New Zealand); the quality of the printouts is less than optimal, because it is inkjet and not laser (Jordan); it is not good for mass production (Jordan, New Zealand); it is hard to load a lot of paper (New Zealand); it does not always feed the transparencies (Jordan); sometimes when they make transfers for the tee shirt press with the small printer, they have to load several sheets to make it thick enough for it to pull one sheet. One instructor at Fort Leonard Wood did not even know that the small printer existed. In addition, the color printer is one component that several locations – Germany, Fort Leonard Wood, and New Zealand – already had, so it was less useful.

The digital camera is used at various locations to take photos of:
- mines and UXO
- tools and equipment (such as probes and metal detectors)
- people (students working individually, team photos)
- field exercises
- before and after a land mine goes off

Use of the digital camera varied by location. Fort Leonard Wood already had one, as did Camp Pendleton. More recent models, such as those that these two locations have, allow images to be saved on disk or another kind of storage card so that the system does not have to be rebooted for images to be downloaded; Camp Pendleton and Germany praised this feature on cameras they owned and recommended that the DSS camera have it as well. User criticisms of the digital camera are the following: the DC-40 does not hold enough photos before they must be downloaded (Germany, Jordan); photos cannot be previewed (Camp Pendleton); the camera runs down the batteries too quickly (Germany); photos are not of optimal quality (Jordan); downloading images was not easy (Fort Leonard Wood); DSS users did not know how to use it (Rwanda, Nicaragua); the cable

was missing (Rwanda); there were problems using the software on another computer (New Zealand); users would like a zoom lens (New Zealand); the camera and cable could not be found in New Zealand – then it was discovered that the instructor who was in charge of the system kept it in his office for safekeeping. One user in New Zealand had had problems with the camera defaulting to a DC50 setting. The camera would resist changing the setting to DC40, which corresponds to the camera model. This was resolved once the system was upgraded for Y2K compliance during our visit.

One instructor at Fort Leonard Wood took the camera with her to Mozambique and used it at a demining site. She photographed where the stores were set up, equipment, first aid, deminers in action, their techniques, and demolitions. She plans to use these photos in future classes.

The scanner is used to scan in:
- lesson plans
- text
- mine images
- other images
- identification badges
- maps
- photos

Many users find that it is useful to have a scanner to create handouts, posters and PowerPoint presentations. Users in Germany and at Fort Leonard Wood have another scanner that they prefer to use because it can scan in documents that are larger than 8 ½ by 11" and is easier to use (Germany). One user at Fort Leonard Wood could not enlarge scanned-in photos to the size he wanted (he should have used PowerPoint or the DSS poster software instead); in Guatemala a user had not known how to troubleshoot why the scanner was not working. A user at Fort Leonard Wood commented that the scanner should be accompanied by an optical character recognition (OCR) program that allows you to edit scanned-in typewritten and hand-written text; the technical assessor told him

that the current scanner's OCR program does have the ability to edit scanned-in typewritten text but not hand-written text. In Jordan the trainers expressed a desire to have Arabic OCR software to allow them to scan in and edit existing demining lessons in Arabic. Because of this limitation, they only use it to scan in images. They would also like to use it on another computer at school; currently they cannot do this because of voltage differences. In Germany they recommended a larger scanner that could scan in maps. The scanner in Laos was not reportedly working prior to the assessment team's visit. The technical assessor found it working and showed users how to use the OCR software to convert forms to an electronic format.

The heat press has been used to make t-shirts of teams (Fort Leonard Wood), the engineering school logo and mines (Jordan). However, the heat press is the least used component for various reasons: it is not needed because there is no mine awareness program (Camp Pendleton, Fort Leonard Wood, Germany); DSS users do not know how to connect or operate it (Rwanda, Guatemala, Nicaragua); users do not have the resources, such as transfers or t-shirts (Rwanda); it is too expensive to use when an iron would perform just as well (New Zealand); it uses a lot of electricity (Jordan); it is tricky to figure out the orientation of the text when pressing the transfer onto the tee shirt (Germany); the transfer went on crooked (Fort Leonard Wood). Negative feedback by some users was balanced by positive feedback from other users. For example, a user in New Zealand reported that you cannot mass-produce using it; on the other hand, another user at Germany had no problems using the heat press after practicing a couple of times and was able to make about 30 tee shirts in one hour. He also said the colors were good, while a user at Fort Leonard Wood found the colors were washed out or the wrong color. However, these users said that the transfers they had purchased were not the Canon brand recommended by the manufacturer. Some users acknowledged that it would be useful in a country with a mine problem (New Zealand) and that t-shirts would promote mine awareness (Guatemala). In Rwanda production of mine awareness tee shirts are subcontracted out so they do not need to use the heat press. The heat press became the center of a political debate at Fort Leonard Wood. When management at the engineering

school saw that t-shirts were made with training team photos, they took away the heat press and stated, "We're not in the t-shirt business."

Many users were dissatisfied with the touch screen monitor – its small size limits its use as a presentation tool, and the touch screen feature is unreliable. Users commented that the touch screen sometimes works very slowly, or does not work at all (Fort Leonard Wood, Germany); it is difficult to use with fingernails (Fort Leonard Wood); it is too sensitive (Jordan, Germany); it is hard to click on the icon you want (Fort Leonard Wood); it is not made for multiple users – it requires recalibration by each new user (Fort Leonard Wood); one user reloaded the software when it did not work (New Zealand); it needs to be easier to calibrate (Germany); the touch screen in Laos was not working because users had changed the settings in order to install a network card. A user in Germany commented that "it's like it has a mind of its own." At a few locations the monitor was not working when the assessment team arrived. At Camp Pendleton, the technical assessor discovered that the CMOS settings had been changed. He changed the cable to the working port and it worked again. In Nicaragua, it was not working because the cable connections to the laptop were loose and the monitor was switched off. This was resolved after the laptop was replaced. The cables connecting to the touchscreen in Rwanda had been connected to the wrong ports and were chewed by rats. The touch screen worked after the cables were replaced.

There was interest in using the DSS as a presentation device. Users at several sites would have a class stand around the DSS, but reported that the monitor is too small for all to see (New Zealand, Germany, Camp Pendleton). In Bosnia in 1997 a DSS trainer found that users had tried to find another way to attach additional monitors for display purposes. They suggested a larger monitor or several additional monitors to use with the DSS. Also in 1997, in New Zealand, users asked if a data projection device could be attached to the laptop computer on the DSS. The DSS trainer showed users how to disconnect the touchscreen from its VGA port on the laptop and use another display device in its place. Other users also suggested replacing the monitor with a projection device (Camp Pendleton) or a bigger monitor (New Zealand).

Some users like having speakers that have English broadcasting from one, and another language coming from the other speaker. However, they have had problems with the speakers falling out of their mounts (Fort Leonard Wood, New Zealand) and suggested a device to hold the speakers in place during transit. This problem was addressed and resolved in the DSS3 by the addition of a locking plate to hold the speakers in place.

Several problems with the cables that are used to connect various components to the system were reported. They have commented that longer cables to the laptop are needed (Fort Leonard Wood); users believe that cables are loosened probably because the trays are pulled out frequently (Jordan). A user at Fort Leonard Wood expressed concern that cables might get loosened or damaged with constant handling; for example, to assemble the DSS, users must open an access door to get to the cables, then must pull the bundle of cables through the case lid. The cables are not the only item at risk: a user in New Zealand reported that the tray handles under the computer and the small printer/scanner were pulled off accidentally but were not replaced. At Camp Pendleton, users recommended color-coded cables and ports to facilitate connecting the system in preparation for use.

Table 10, below, summarizes problems reported by DSS users and their resolution. Tables 10a through 10h describe these problems in greater detail for each location.

Table 10: Problems with Components and Outcomes

Deployment sites	Length of Time with DSS Prior to Visit	Components' Problems / Solution (Resolved, Replaced, or Not Replaced)												
		Poster printer	Small printer	Touch-screen monitor	Speaker	Digital camera	Key-board	Tray handles	Scanner	Power adapter for scanner	Power adapter for touch screen	Power condition-er	External hard drive	Lap top
Camp Pendleton, CA	2.5 months	X / resolved		X / resolved	X / resolved	X / resolved								
Fort Leonard Wood, MO	18-21 months													
Germany	8 months				X / resolved	X / replaced								
Guatemala	~18 months								X / replaced					
Honduras/ Nicaragua	~18 months		X / will be replaced											
Jordan	11 months				X / replaced		X / replaced			X / replaced	X / replaced			
Laos	~21 months			X / resolved										
New Zealand	11 months				X / resolved			X / not replaced				X / not resolved		
Rwanda	26 months	X / replaced; X / resolved*	X / resolved	X / replaced; X / resolved*	X / resolved	X / resolved			X / not replaced				X / resolved	X / resolved

*Two problems reported in one cell indicate problems with two components.

Camp Pendleton
Table 10a: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Poster printer	Intermittent problems printing	Assessor could find no problems	Attempting to print images with large file sizes
Touchscreen monitor	Not working (although monitor displayed image from the computer)	Serial port on laptop used by touch screen interface disabled; assessor moved serial cable to an enabled serial port on laptop	User may have reset the CMOS settings which disabled one serial port and enabled another
Digital camera	Not working	Plugged serial cable into correct port	Serial cable plugged into incorrect port
Speaker	One stopped working	Replaced damaged speaker wire	Speaker wire may have been damaged by pinching it between the case and lid or sliced by hardware on moving tray

Fort Leonard Wood

All hardware components were tested and found to be operable. When the technical assessor booted up the system, there was an indication that the DSS had not been used for at least the previous five months. Windows 95 displayed a message to alert the user that the system time was changed from standard time to daylight savings time. The computer displays the message the first time it is turned on and will only display the message again after the next time change.

Germany
Table 10b: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Digital camera	Not working	Replaced	
Speaker	Speaker screen loose; speaker still functioned	Speaker mounting fixed by assessor (in DSS3, the speakers are held in place by a locking plate)	May have loosened while moving
Interaction with building electrical system	Plugging DSS into commercial power outlet tripped a circuit breaker	User solution: plug DSS into locally-acquired step-down transformer	Currency fluctuations in building's electrical system

Guatemala
Table 10c: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Scanner	Not working	Replaced	Not determined

Jordan
Table 10d: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Arabic keyboard*	Failed	Replaced	Cord on keyboard damaged
Power adapter for the touchscreen*	Failed	Replaced	Not determined
Power adapter for the scanner*	Failed	Replaced	Not determined
Speakers*	Failed	Replaced	Not determined

*All items were reported having failed and replaced prior to the assessment team's visit.

The possible cause of failure for the power adapter and speakers was not determined. However, there are two possible reasons: 1) manufacturing defects, or 2) the components were plugged in without the power conditioner by untrained users.

Laos
Table 10e: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Touch screen monitor	Not working	Reset serial port and upgraded its software	Serial port settings changed when network card installed by users

New Zealand

Table 10f: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Power conditioner	Had failed, sent for repair locally, and had recently failed again	Needs to be replaced	?
Speaker	Speakers fall from their mounts during shipping	Repaired but may happen again following the DSS's next move	Loosened while moving
Tray handles under the computer and portable printer/scanner	Pulled off accidentally but not replaced		Frequent use

The users also lost the power cable to the power conditioner, so they remade a new power cord with a plug connector compatible to New Zealand power outlets.

Nicaragua

Table 10g: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Portable printer	Printed images unclear	Will be replaced	Used outdoors and got dusty

Rwanda

Table 10h: Resolution of Components Problems

Malfunctioning Item	Problem	Solution	Possible Cause
Monitor*	Broken	Replaced	Shipping
Poster printer*	Broken	Replaced	Shipping
Poster printer (replacement)	Did not print	Installed new ink cartridges	Dried out ink
Small printer	Did not print	Installed new ink tanks	Dried out ink
Touch screen monitor	Did not work	Replaced VGA and serial cables	Rats had chewed on monitor cables
Speakers	Did not work	Repaired speaker wires	Rats had chewed on speaker wires
Digital camera	Not working	Provided a new cable	Cable missing
External hard	Not working	A replacement	A user tried to add an unknown

Malfunctioning Item	Problem	Solution	Possible Cause
drive		laptop was installed and year 2000 upgrade was performed	external device to the DSS system by turning off the automatic resource assignment feature. This may have been done in order to put the DSS on a network or to add another piece of hardware. This action disabled the SCSI adapter controller card operating the external hard drive.
Laptop computer	CD-ROM drive operating intermittently	A replacement laptop was installed and year 2000 upgrade was performed	A user tried to add an unknown external device to the DSS system by turning off the automatic resource assignment feature. This may have been done in order to put the DSS on a network or to add another piece of hardware.
Scanner	Failed or was broken	Not replaced at government project manager's direction (he did not think it would be used	Not determined

*These were reported having failed and were replaced prior to the assessment team's visit.

The technical assessors believe that the heat press may be damaging power conditioners or causing them to fail. The rated power required by the heat press is close to or exceeds the individual capacity of a single outlet on the power conditioner.

Tools and Technologies Used with or Added to the DSS

The training materials residing on the DSS are not fully utilized. It was instructive to learn about what materials other than those contained in the DSS are used to support training of humanitarian demining. Table 11 summarizes the tools, technologies and hard-copy materials used in addition to the DSS or loaded onto the DSS.

Table 11: Other Tools, Technologies, Strategies, Exercises Used with or Added to the DSS

Deployment sites	Description of Tools
Bosnia & Herzegovina	▪ Training in simulated minefield ▪ Experience in medical and simulated casualty drills ▪ Use of posters and warnings utilized in mine awareness
Camp Pendleton, CA	▪ Digital Camera – they have added a Sony camera that makes it easier to take pictures, that holds more pictures, and allows you to view the pictures right after you take them ▪ Photo Workshop/Micrografx Picture Publisher – loaded on the system to create and alter images - more user friendly than PowerPoint and creates clearer images.
Fort Leonard Wood, MO	▪ MineFacts (on a desktop) ▪ Ordata ▪ Canadian Forces SME Mine Database ▪ Deck of cards created at Fort Leonard Wood with images (ordnance, mines) on them ▪ Web sites for the UN, Red Cross, JMU, destination country, and humanitarian demining (didn't name specific ones) ▪ TC (training circular – another regulation book published by the Army) ▪ Mine/countermine field manual
Germany	▪ CFSME Mine Database ▪ Ordata ▪ Swedish CD on mines ▪ Various land mine web pages including the Defense Visual Imagery with NATO and U.S. military images, UN site ▪ UN SOPs ▪ Danish Army training materials ▪ Jane's Weekly (sent to him by Bill Schneck) ▪ Documentation from a UK trainer ▪ Lessons learned onsite ▪ Subject matter experts
Guatemala	▪ Internet
Nicaragua	▪ Handouts ▪ Explosive Book ▪ Booby Trap Manuals ▪ International Demining Regulations (IDR) Booklet ▪ Checkup Sheets (MARMINCA writes this based on the IDR)
Jordan	▪ Inert mines ▪ "Data show" (type of projector) Loaded on the DSS:

Deployment sites	Description of Tools
	▪ Arabic Windows 95 ▪ Arabic Microsoft Office 97
Laos	Loaded on the DSS: ▪ Lao keyboard mapping software to allow users to type Lao in Microsoft Office environment
New Zealand	▪ Projector ▪ Images provided by other instructors ▪ Training Management Plans (TMPs) – guidelines for a class ▪ Task Analysis Plans (TAPs) – guidelines for a class ▪ Inert mines for demonstrations ▪ U.N. standards for demining training ▪ PowerPoint for presentations and handouts for classes ▪ MineFacts on another computer ▪ Information from civic organizations ▪ Internet ▪ Intranet (which is a defense wide network, where he pulls American and British publications) ▪ Periods of Instruction ▪ Flash cards with different types of land mines on each with a description of them ▪ Jane's Guide to Landmines and Mine Clearance ▪ Canadian Forces Landmine Database
Rwanda	▪ NDO database ▪ U.S. Humanitarian Demining Special Forces training binder ▪ PageMaker 6.5 ▪ WordPerfect Suite 7

As depicted in the table above, the more developed countries with the DSS (U.S., Germany, New Zealand) had multiple resources available for preparing for and presenting demining and related training. The less developed countries (Guatemala, Nicaragua, Jordan, Rwanda, Bosnia and Herzegovina) had fewer resources.

Maintenance and Supplies

Before shipping the DSS to a field location, DSS technicians ensure that all DSSs are shipped with properly functioning components and are fully stocked with ink and paper supplies as listed in Tables 12 and 13.

Table 12: Poster Printer Supplies

Quantity	Item
2	Cyan Ink Cartridge
2	Magenta Ink Cartridge
2	Yellow Ink Cartridge
2	Black Ink Cartridge
7	Cyan Ink Refill Bottle
7	Magenta Ink Refill Bottle
7	Yellow Ink Refill Bottle
7	Black Ink Refill Bottle
7	Paper Roll Ink Refill Bottle
2	Replacement Paper Cutters

Table 13: Portable Printer Supplies

Quantity	Item
2	Color Ink Cartridge
6	Color Ink Tank for the Color Ink Cartridge
6	Black Ink Tank for the Color Ink Cartridge
2	Black Ink Cartridge
6	Black Ink Tank for the Black Ink Cartridge
3	8 ½ x 11" Paper, Ream of 500 Sheets
1	T-shirt Transfers, Package of 10 sheets
1	8 x 5" Index Cards, Package of 500

Each location reported whether or not they had replaced or depleted supplies. The specific supply replacement or depletion is listed in Table 14.

Table 14: Supplies Replaced at Each DSS Site

Deployment sites	Supplies Replaced by Users									
	Poster printer paper	Poster printer cartridge	Poster printer ink refills	Spare poster printer paper cutters	Small printer paper	Small printer cartridge	Small printer ink refills	Index cards	T-shirt transfers	Camera batteries
Bosnia & Herzegovina – Sarajevo					*X*	*X*	*X*	*X*	*X*	*X*
Bosnia & Herzegovina - Mostar	X	X	X			X				X
Camp Pendleton, CA			X				X			
Fort Leonard Wood, MO	X	X	X		X		X		X	X
Germany	X									
Guatemala	Users have not replaced supplies because they have not used the DSS much.									
Nicaragua	Poster printer paper and ink, and small printer ink supplies were missing. The technical assessor could not determine if the supplies had been installed in the printers.									
Jordan										
Laos*	X *X*	*X* X	*X* *X*	X *X*	X X	*X*	X X	*X*		X *X*
New Zealand	X		X		X		X			
Rwanda	Users have not replaced supplies because: ▪ They do not know how to ▪ They cannot get new supplies									

X – Supplies that have been replaced

X – Supplies that have been depleted but not reported replaced

*In the questionnaires, "replaced" or "depleted" could be checked off next to each kind of supply. Users in Laos reported replacing or depleting supplies on a single DSS. Their responses are confusing when compared. Either one user did not know that depleted supplies had been replaced by another user, or they may not have understood the difference between depleting and replacing.

- **Ease of Locating Supplies**

Table 15: Ease of Locating Supplies

Deployment sites	Less difficult to find	More difficult to find	Unknown
Bosnia & Herzegovina			X
Camp Pendleton, CA	X		
Fort Leonard Wood, MO	X		
Germany	X		
Guatemala	X		
Nicaragua		X	
Jordan	X*		
Laos			X
New Zealand	X		
Rwanda		X	

*Ink supplies for both printers had been provided by the U.S. Embassy. However, it is unknown whether it is difficult to find other kinds of supplies.

Supplies provided with the DSS support the user's ability to print training aids or mine awareness materials using the Canon BJC-70 bubble jet small color printer and the Encad Novajet IV poster printer. In the United States, supplies for these printers are readily available and can be acquired in a day or two. Canon BJC-70 ink and paper supplies are purchased or ordered from several office or computer chain stores throughout the United States. Encad Novajet IV supplies are available either directly from the manufacturer or from several Encad resellers. There are less expensive generic ink cartridges and ink refill alternatives for both printers; however these generic alternatives are not as reliable or print as well as the Canon or Encad brands. In addition, the Canon brand of t-shirt transfers are best for the Canon printer. Users at Fort Leonard Wood reported that another brand of t-shirt transfers did not feed properly into the small printer and did not print colors correctly. However, paper substitutions seem to be possible. For example, in Germany users found a less expensive, better quality brand of poster printer paper and have had no problems with it. Also, users may choose between costlier, longer-lasting lithium batteries, or less expensive, shorter-lasting dry cell AA batteries for the digital camera. Users in Rwanda, on the other hand, had a difficult time obtaining supplies.

They requested t-shirt transfers from a demining contractor several times and were unsuccessful. They did not ask the U.S. Embassy for supplies because they did not think the Embassy would help them.

- **Ease of Changing Supplies**

Paper and ink for the DSS portable printer or poster printer are normally easy to change. The two most difficult tasks users perform on both printers are clearing a paper jam and recognizing when to change ink cartridges.

On the portable printer, paper feeds automatically from the feed tray. The feed tray has a guide to limit the number of pages loaded in the tray to prevent the paper from jamming in the printer. If a piece of paper jams in the portable printer, it must be cleared manually. This can result in small pieces of paper remaining in the roller preventing other paper from loading. As long as the user uses the type and weight of paper recommended by the printer manufacturer and does not attempt to load too much paper, paper jams are rare.

Paper also feeds automatically in the poster printer but jams more easily. Paper jams occur more frequently when the edges of the roll of paper are dented or torn or a new roll of paper is used in humid climates. Users can prevent paper jams by taking care of the rolls of paper by not dropping the rolls, storing the paper flat, protecting the ends from damage, and by leaving the paper out for a day to adjust to the humid conditions.

On the portable printer, replacement ink is provided in small replacement ink tanks that the user inserts into the printer cartridge. When the cartridge runs out of ink, the old tank is removed from the cartridge and a replacement tank inserted. The ink tank does not have a visual indicator that it is empty. So when the printer cartridge needs cleaning, it may stop printing ink, providing a false indication the ink tank needs replacing. The correct procedure to follow whenever the printer stops printing ink is to clean the printer cartridge, then test the printer. If the printer is not printing after the cartridge has been cleaned, the ink tank probably needs replacing. If the ink tank is replaced and it still does not print, then the printer cartridge may no longer be functioning. It would be easy for a

user to think the portable printer supplies are depleted if these procedures are not tried first.

The poster printer has ink cartridges with refillable wells. When a cartridge runs out of ink, the user should remove the cartridge from the poster printer and refill the ink from the appropriate ink bottle provided with the DSS. The ink cartridge also does not have a visual indicator that it is empty. If the cartridge stops printing, the user should attempt to fill it with ink. If it still does not work, the cartridge should be replaced. If the poster printer cartridges are removed from the poster printer and are not properly covered to keep them moist, or if they are not used for a long period of time, they dry out and must be replaced. The technical assessor had to replace ink cartridges at several DSS sites.

Explanation of Y2K Updates

The Y2K problem or millennium bug resides in systems with program code that incorrectly processes dates after December 31, 1999. The problem could manifest itself in several possible ways: the system could interpret 21st century dates as 20th century ones, not recognize 21st century dates at all, or incorrectly interpret dates in 21st century leap years. The Y2K problem may be caused by something as simple as having a 2-digit year in a spreadsheet or as complex as a calculation on a date value buried in software code. Either way, it is possible Y2K problems could result in the computer or software application shutting down, even permanently.

For the DSS, there are several places the Y2K problem could reside:
▪ In the computer BIOS
▪ In the operating system software Windows '95
▪ In the program code of commercial software applications installed on the DSS, such as Office '95 and '97
▪ In the program code of other software applications that run DSS hardware components, such as the UPS, digital camera, scanner, or touchscreen software

- In program code of custom software applications created for the DSS, such as Content Manager, MineFacts, or DSS 2 menu
- In the firmware of DSS hardware components, such as the poster printer or digital camera
- In user-created spreadsheets and databases

A review of DSS Y2K readiness revealed the following necessary actions to make each DSS Y2K ready:

- Install Norton 2000 Y2K utility software on the DSS 2 laptop or DSS 3 computer
- Install the Windows 95 Y2K software update
- Install the appropriate Microsoft Office Y2K software service release
- Install the Y2K compliant version of the digital camera software
- Flash the poster printer firmware with the Y2K compliant software version.
- For the DSS 2 only, flash the computer basic input/output system (BIOS) with the Y2K compliant software version
- For DSS 3 only, install the uninterruptable power supply (UPS) Y2K software upgrade

The software and hardware components for completing year 2000 readiness were acquired after the DSS field assessment had begun.   Table 16 below describes when the upgrades were or will be performed.

Table 16: Progress of Y2K Upgrades

	Y2K Upgrade Made During Assessment Visit	Y2K Upgrade Made After Assessment Visit	Y2K Upgrade Still to be Made	Y2K Upgrade Will Not Be Made
Bosnia & Herzegovina				X*
Camp Pendleton, CA		X		
Fort Leonard Wood, MO		X		
Germany	X			
Guatemala		X**		

	Y2K Upgrade Made During Assessment Visit	Y2K Upgrade Made After Assessment Visit	Y2K Upgrade Still to be Made	Y2K Upgrade Will Not Be Made
Nicaragua	X			
Jordan			X (early December)	
Laos	X			
New Zealand	X			
Rwanda	X			

* The government project manager was denied clearance for any visitors to perform the upgrade.

** The Guatemala DSS had the Spanish version of Windows 95 and Office 97 which would not accept the English Y2K software updates. A DSS technician returned to Guatemala to complete the Y2K readiness update for these two components.

Logistics

Some locations, such as Jordan, Germany and Camp Pendleton, have rarely or never moved the DSS. Others, such as Rwanda and Fort Leonard Wood, have moved it a few times. New Zealand has transported the DSS the most often. Users have relocated the DSS to a different building or classroom at their site (Camp Pendleton, Fort Leonard Wood); to a new location over bumpy, unpaved roads (Rwanda); and over long distances - from Honduras to Nicaragua, and between different cities in New Zealand. Reasons the DSS was moved were:

- to demonstrate it to a General (Camp Pendleton)
- to use it in a different classroom (Fort Leonard Wood)
- to bring it out of a warehouse for the DSS assessment team visit (Fort Leonard Wood)
- when the National Demining Office (NDO) moved to a new location (Rwanda)
- when the NDO used it in a course (Rwanda)
- when MARMINCA operations shifted from Honduras to Nicaragua
- to demonstrate it at expositions (New Zealand)
- to show important visitors (New Zealand)

Reports about ease of transporting the DSS vary. Some users reported it was difficult to move because of the weight of the system and its components (Camp Pendleton, Fort Leonard Wood, Rwanda, Guatemala). In Jordan and Germany, the weight of the system

coupled with the lack of an elevator in a multi-level building makes users reluctant to move the system. Several users commented that moving causes no problems as long as more than one person is available to help. A few users commented that having the system built into the back of the truck would make it very handy for on-the-road mine awareness programs (Germany, New Zealand, Rwanda, Fort Leonard Wood).

Users have encountered some problems with the cases as a result of transporting the DSS. These problems are described in Table 17.

Table 17: Problems with the DSS Caused by Transportation

Part	Problem
Locking horizontal bars attached to the cases	Lost the knobs off the cap ends, making it difficult to loosen after completion of use (New Zealand)
Silver clasps holding the case lids	Sometimes they get twisted and users have to beat them straight with a hammer to get them back in place to use them (New Zealand)
Black knobs on the holding bars that connect cases A and B when assembled	Come off easily (New Zealand)
Wheels	Have trouble moving the DSS over carpet (Fort Leonard Wood)
Handles on cases	Difficult to use when moving the DSS (Fort Leonard Wood)
Speakers	Speakers became detached from their mounts (Germany, New Zealand)

Users recommend having more durable clasps and knobs, handles that are easier to manipulate when moving the system, and better wheels on the DSS cases. The speaker mounts in the DSS2s were replaced in the DSS3s by a locking plate that holds the speakers in place.

Several users had problems connecting the cables, especially when they did not get hands-on practice assembling the system (Fort Leonard Wood). Once a person assembles it once, a few say it is easy to do it the next time (Camp Pendleton, Guatemala). The diagram that shows how to connect the cables sounds like it is used and has been helpful.

A user in Rwanda used it for guidance, and a user in Nicaragua said that since the diagram was missing he had problems connecting it.

How Users Intend to Use the DSS

New Zealand and Germany have no particular plans for the system. Personnel turnover in New Zealand and Guatemala makes it difficult for them to train new users and sustain interest in the DSS.

Other sites had interesting plans for their DSS, as reported in Table 18.

Table 18: Plans for the DSS

Deployment sites	Take out of country	Scan in hard copy demining and medical training materials	Offer demining, medical, and or mine awareness training	Translate current DSS materials	Perform administrative functions
Bosnia & Herzegovina					
Camp Pendleton, CA	Ethiopia and Eritrea	Subjects: • transportation • communication • mine detection • UXO			
Fort Leonard Wood, MO					• logging different mines found • gathering survey data • accessing MineFacts • typing class schedules
Germany					
Guatemala			X		
Nicaragua			X		
Jordan			X	X	
Laos					
New Zealand					
Rwanda			X		

Part III: Discussion

There is undeniably a strong need for mine awareness and demining training at the DSS deployment sites visited. At some locations the Demining Support System was used quite frequently, more than once a week, while at other locations, the use was very minimal. The use of the DSS may increase if some changes were made to training content, software applications, hardware components, system training and training support, and maintenance support.

Training content changes may include lessons with more up-to-date procedures organized in multiple skill levels reflecting the demining standards at each site. In addition, the lessons that are most used at a particular site should be in a language that is understood by a number of trainers and trainees. Many of the users speak English, but English language skills in Rwanda, Guatemala and Nicaragua were noticeably lacking, requiring interviewers to conduct interviews in these locations in French and Spanish and DSS training in Rwanda to be presented in Swahili. Users requested training contents in Arabic (Jordan), French or Kinyarwanda (Rwanda), French and German (Germany), Croatian, Serbian and Bosnian (Bosnia and Herzegovina), and Lao (Laos). Having content only in English limits the number of users in these locations. Moreover, software applications are not meeting users' needs because Microsoft software (Windows, Office Suite) on the DSS is outdated compared to software on users' desktop computers. This is problematic when troubleshooting or when users need to edit documents on both the DSS and a desktop computer.

MineFacts is a topic that elicited much feedback. Users rely on MineFacts or other databases in order to identify different mines that have been found or that might be encountered. MineFacts is the most used feature of the DSS yet has several deficiencies such as incomplete entries, existing mines that are excluded, incorrect or incomplete measurements, and poor image quality.

There were various hardware components that users recommended adding to the system that would enhance the training they conduct. These components would allow users to deliver training to a larger audience via the DSS, download materials or exchange demining information with others, and create and view their own training videos. It would also facilitate archiving and transferring data between the DSS and other computers, and aid in using components independently of the DSS.

DSS usage may increase if system training and training support is reinforced. Many users did not seem at ease using the DSS during the assessment team's visit. Some reasons include irregular use, insufficient or no DSS training from a Star Mountain employee, and language barriers. The computer experience of trainees varies. Some trainees require slower paced system training with much review and hands-on practice, and others who use computers frequently may require less review and practice and can proceed through more quickly. Training received by the first group of users may have been insufficient. Moreover, high personnel turnover among the original trainees at several locations combined with inadequate training of their successors has contributed to low usage. Finally, the fact that some users are not fluent in English has greatly reduced the impact of system training and limited the usefulness of the User's Guide.

Regular system maintenance underlies successful system use. Several DSS users had neglected to perform system maintenance and consequently reported problems using different components. Several of these problems were resolved by installing new supplies. Some of these same users requested additional maintenance or troubleshooting training, which demonstrates their motivation to use the system.   Maintenance of hardware components increases the chances the system will continue to function effectively in support of users' demining or mine awareness mission.

Part IV: Recommendations

The DSS has a lot of potential to help people in mined countries to promote mine awareness and support the training of demining and medical skills. Implementation of some of the suggestions below may increase use of the training contents and productive use of the components, and may assist NVESD in achieving its goals.

Medical Training Field Assessment

We recommend conducting a field assessment to gather more information on how the demining community conducts medical training. We found at all locations that a different branch of the users' organization handled the medical training, and the users we interviewed do not use the medical training in the DSS at all. After all the necessary data is gathered, we recommend a separate medical training package be sent to those sites that have expressed an interest and exclude medical training from future DSSs deployed.

Demining Training Field Assessment

We recommend a detailed field assessment to gather more complete information about the users and their demining organizations in order to better meet their needs. This should be done before any actions are taken on the recommendations below. Such an assessment should focus more on the training that users conduct and the organization they support. This information could be used to tailor the DSS to their needs. These actions should first be performed in Jordan because it is the site that uses the DSS most often; users in Jordan would then be able to provide thorough feedback that would help us determine whether these same actions should be performed elsewhere.

A sample list of questions that could be asked in either the medical or demining training assessment is in Table 19 on the following page.

Table 19: Possible Demining and Medical Training Field Assessment Questions

Category	Question
Audience	What languages do your trainers or trainees speak? Read? Which is the dominant (most-spoken) language?
	What is your organization's mission?
	How do you present your training? What kinds of materials do you provide your trainees? (spoken versus written, images versus words)
	What is your level of computer skills?
	How many people do you expect to use the DSS?
	How do you plan a demining mission?
Training contents, software, platform	What lessons on the DSS do you use?
	How do you use these lessons? (use complete lesson, use part of the lesson, customize the lesson, only video, only lesson)
	Do you have training POIs?
	What percentage of training do you offer in the classroom versus outdoor field exercises?
	How do you manage your files?
	What software packages does your organization currently use?
	What medical procedures are deminers trained on?
	What software package do you use to manipulate images?
	What word processing software do you use?
	What is your skill level on the software you currently use?
	What operating system does your organization support? (i.e. DOS, Windows 98 or Macintosh)
	Where do you keep the lessons you use (that are not in the DSS)? (in a binder, on another computer, on disk)
Hardware	What types of hardware components do you use to create training aids?
	What current hardware is available to you for use? (i.e., scanner, small printer, poster printer)
	Who is responsible for performing system maintenance?
	What is your skill level in repairing and maintenance of hardware?
	What do you do if you cannot repair hardware? (what other resources do you have?)
Miscellaneous	Do you have internet capability?
	What are the voltage conditions where you would place the DSS?

Based on the feedback that would be gathered through these assessments, the following changes may be recommended.

Demining Training Content and Software Applications

- Write training content based on different skill levels or techniques, ranging from general to specific

- Incorporate the demining training each country uses into the system

- Incorporate the standards underlying the training at each location into the training content

- Update the content to reflect more recent developments in procedures and knowledge

- Translate the most used lessons at various locations into the host country's language

- Disseminate lesson changes to users by the internet or by sending a CD

- Revise MineFacts to include additional mines, more details for each mine, complete measurements, improved images; also consider incorporating other kinds of explosives such as UXO into MineFacts

- Add a file management system to the DSS that would allow users to organize their files for easy access and presentation

- Add the most recent version of Microsoft Windows and Office Suite

Hardware Components

- Remove the heat press (or make it an option only for those with a mine awareness campaign)

- Remove the touch screen capability or provide a better version that is less sensitive

- Users requested that six additional hardware components be added to the DSS:
  - a projector
  - network capability/modem
  - video camera
  - VCR
  - zip drive
  - a power conditioner for each piece of equipment

DSS Training and Training Support

- Make DSS training more detailed
- Extend the duration of training

- Include in system training an overview of all lesson contents and how to incorporate the DSS into their own demining program
- Include a thorough overview of troubleshooting and daily maintenance
- Include laminated job aids attached to each component for quick reference for:
  - assembly of the DSS, starting the system
  - using the software
  - locating the files
  - starting, connecting, and operating each hardware component
- Include two separate guides for users:
  - user and maintenance guide (that shows how to use components, and includes instructions for changing cartridges, refilling ink; supplies to use; troubleshooting help)
  - training guide (that would help users train their colleagues to use the DSS)
- Write the guides at a level that could be understood by those with less computer experience
- Include many illustrations and examples in the guides
- Translate the guides and job aids into the host nation's language if needed
- More complete information provided to users about the DSS which may include:
  - an introductory video of system capabilities (should be sent prior to DSS deployment)
  - a letter explaining the many uses of the system
  - suggestions on how users could incorporate the system into their organization
  - information on how to report a problem
  - procedure for user diagnosis
  - procedures for sending the component for repair
  - on-hand stock of replacement components
  - frequently asked questions to help the user start and operate the system
  - the email address to Star Mountain and to the government point of contact
  - a DSS web site (from which to download technical information, update drivers and software)
- Better communication between embassies, DSS deployment site and the U.S.

- Government point of contact clearly indicated on each hardware component and on all guides

Maintenance Support
- Include periodic maintenance supplies with each DSS deployed:
  - Cotton swabs
  - Cleaning liquids
  - Rags
  - Brushes
- Replacement items:
  - VGA cables
  - Printer cables
  - Serial cables
- Small computer tool kit for making repairs

Attachment A

DSS Field Assessment Questionnaire
January 28, 1999

Introduction:

Star Mountain developed the Demining Support System (DSS) to promote training and mine awareness as part of the United States Demining Assistance Program. The DSS has been deployed to multiple sites throughout the world. It is critical that lessons learned from experienced users of the DSS be compiled and analyzed in order to increase the sustainability of the DSS.

We would like to thank you in advance for filling out this questionnaire. Your responses will provide valuable input to de-mining technology developers, and will be used to guide a more in-depth evaluation of the effectiveness of the DSS. Please feel free to write on the back of these pages or to attach separate pages if there is additional information you would like to communicate to us. We are eager to receive your feedback.

Thanks very much for your help.

Instructions – Please read before proceeding!
To indicate a response from a range of possible responses, put an X next to the one that best describes your answer. For example, if you are answering Yes to a question, respond in the following way:
__X__ Yes   _____ No

Background Information

Name: _____   Organization/Affiliation: _____

What is your title/role in the organization? _____

How long have you been in that role? _____

Please describe your experience with computers prior to the DSS:

What experience do you have de-mining? (Please include years of experience and the type of de-mining activities)

What experience do you have training?

How did you first learn about the DSS?

Did you receive DSS training? _____ Yes _____ No

If yes: Who provided the training? _____

        Was it adequate? _____ Yes _____ No

        What would you change about the training?

Have you found the DSS User Guide useful? _____ Yes _____ No

What would you change about the Guide?

DSS Use

1. How often do you personally use the DSS?

        _____ More than once a week
        _____ Once a week
        _____ 2-3 times a month
        _____ Once a month
        _____ Several times a year
        _____ Rarely

2. Please rate the following DSS activities in terms of how often you perform them. The most often performed activity will be rated 1; the next most often performed activity will be rated 2, and the least often performed activity will be rated 3.

        _____ Create training materials
        _____ Conduct training
        _____ Enhance existing lessons in the DSS
        _____ Other (please describe) _____

3. Please rate the following DSS activities in terms of how often you perform them. The most often performed activity will be rated 1; the next most often performed activity will be rated 2, and the least often performed activity will be rated 3.

        _____ Create de-mining training materials
        _____ Create medical training materials
        _____ Create mine awareness training materials

4. Please rate the following DSS activities in terms of how often you perform them. The most often performed activity will be rated 1; the next most often performed activity will be rated 2, and the least often performed activity will be rated 3.

        _____ Conduct de-mining training
        _____ Conduct medical training
        _____ Conduct mine awareness training

5. What was your goal the last time you used the DSS? (Check as many as apply)

        _____ Create de-mining training materials
        _____ Create medical training materials
        _____ Create mine awareness training materials
        _____ Conduct de-mining training
        _____ Conduct medical training
        _____ Conduct mine awareness training
        _____ Add new information to existing lessons in the DSS
        Other (please describe) _____

6. How helpful was the DSS in achieving that goal?

        _____ Not helpful
        _____ Somewhat helpful
        _____ Very helpful

7. For each of the following activities, please rate how helpful the DSS is in general. For each item, place an X in the column that describes your response.

	Not Helpful	Somewhat Helpful	Very Helpful
Create de-mining training materials	_____	_____	_____
Create medical training materials	_____	_____	_____
Create mine awareness training materials	_____	_____	_____
Conduct de-mining training	_____	_____	_____
Conduct medical training	_____	_____	_____
Conduct mine awareness training	_____	_____	_____
Add new information to existing lessons in the DSS	_____	_____	_____
Other _____	_____	_____	_____

8. Please estimate how many of each of the following you have created for training purposes and for local mine awareness:

	De-mining Training	Medical Training	Local Mine Awareness Training
Posters	_____	_____	_____
Scanned images	_____	_____	_____
Heat transfers	_____	_____	_____
T-shirts	_____	_____	_____
Digital photos	_____	_____	_____
Small printer images	_____	_____	_____

9. Please estimate how many times you have used each of the following components.

_____ Digital camera
_____ Color scanner
_____ Heat press
_____ Poster printer
_____ Mine Facts database
_____ Content manager
_____ Small color printer

10. Please check the DSS features you use in teaching the following courses.

	Training videos	Practical exercise index cards	Viewgraphs	Posters / Images
De-mining training	____	____	____	____
Medical training	____	____	____	____
Mine awareness training	____			____

11. For each of the following supplies, check those for which the original supply has been depleted *AND* indicate whether you have been able to find replacements.

	Depleted	Replaced
Poster printer paper	_____	_____
Poster printer cartridge	_____	_____
Poster printer cartridge ink refills	_____	_____
Spare poster printer paper cutters	_____	_____
Letter paper	_____	_____
Index cards	_____	_____
Cloth transfers	_____	_____
Canon color printer cartridge	_____	_____
Canon ink refills	_____	_____
Camera batteries	_____	_____

12. Have you ever had to repair the DSS?   _____ Yes   _____ No

13. Please indicate which components of the DSS are NOT currently working. (Check as many as apply.)

_____ Digital camera   _____ Touch screen monitor
_____ Color scanner   _____ Computer
_____ Heat press   _____ UPS (DSS3)
_____ Poster printer   _____ Keyboard (DSS3)
_____ Small color printer   _____ Computer monitor (DSS3)
_____ Mine Facts database   _____ Content manager (DSS2 U, DSS3)

14. Has the DSS been used at multiple sites?   _____ Yes   _____ No

15. If yes, how many sites? _____

16. Would you like to see the course content translated into another language?
          _____ Yes   _____ No

17. If yes, what language(s)? _____

18. Would you like to have software applications available in another language?

                                                 _____ Yes   _____ No

19. If yes, what language(s)? _____

20. How would you change the DSS?

21. Are there features or functions you would like to add to the DSS? Please describe.

22. What aspect of the DSS is most useful to you? _____

Why?

23. What aspect of the DSS is least useful to you? _____

Why?

24. Other than the DSS, what tools, technologies, strategies, and exercises do you use to conduct the following kinds of training?

De-mining training:

Medical training:

Local mine awareness training:

25. If we have follow-up questions to ask you, how can we reach you?

Phone: _____   Fax: _____

Address: _____

Email: _____

Attachment B

Field Assessment Interview Guide

I.   **Introductions**

- We are here to conduct an assessment of the DSS – to find out how you are using it, how it is meeting your needs, and to identify the needs it could better meet.

- This interview is a follow-up to your completed questionnaire and a way for you to expand on your answers.]

- We are very interested in your feedback and appreciate the time you are taking to meet with us.   It is important for us to know about the weaknesses as well as the strengths of the DSS. The lessons that DSS users have learned will be very useful input for improving the DSS.

- The interview is scheduled to take about **2 hours**. Are you now available for **two hours**?

- The interview consists of a few sections: in the first part we will ask you about your background prior to using the DSS; then we will ask general questions about how **you** use the DSS; in the third part we will ask specific questions about your use of lessons, software and components provided with the DSS. At the end of the interview we will go to the DSS and ask you to show us how you use it.

- Please feel free to ask questions as we go along. Do you have any questions at this point?

II. **Background**

"To start off, I'd like to get some background information so we can better understand how you got started using the DSS"

A. What is your role in the organization?

B. How long have you been in that role?

C. What is your computer experience, for example, the type of software, the type of computer - time line of experience?

D. Have you ever demined?

E. Have you ever conducted training?

F. How long have you been using the DSS?

G. Did you receive DSS training? From whom? Was it adequate? Is there anything you would change about that training?

III. <u>Understanding the context in which the DSS is used</u>.

"In this next section, I'd like to talk to you about your actual experiences with the DSS."
A. How often do <u>you</u> use the DSS?

B. Could you give me some examples of what you use the DSS for? [Get 2-3 examples]

C. What other things do you use it for?

In addition to _____[answer from B or C]_____, would you like to be able to create other files on it or show other files on the screen? Or anything else?

D. Can you give me an example when you used the DSS and everything went well?

E. Can you give me an example when you used the DSS and had some problems?

F. Do you ever use the system to develop training materials? As a training aid in the classroom? (Find out how often for each.)

G. We have identified 2 uses (to develop training materials, to deliver training during a class) Are there other uses?

- Tell me about the last time you used the DSS?

  (The interviewer will try to get the whole story from the recognition of the need for the DSS (preparing a new course, identified a new type of mine, etc.) to the final result.)

(Try to get 3-5 examples of DSS use)

  Listen for:

  (**Need to know the stages and then bring them back to each stage and have them break each stage down)

  - The interviewee's goal in this incident

  - How the DSS was used

  - Violated expectancies/surprises (about the DSS itself, about participants' reactions, etc.) [Does this happen a lot?]

- The context in which the DSS was used (Was the interviewee working alone? With others? Under what conditions? With time pressure?) [Do you often work in these conditions?]

- Is this how the interviewee typically uses the DSS?

IV. <u>Direct Questions</u>

Specific Lessons:

<u>Demining Training</u>
- Do you use the de-mining training lessons? If no, why not? If yes, how often?

- Which lessons do you use? [ask them from table or show them and have them mark off]

- Have you ever wanted to change the course?

- Were you able to change it?

- What kind of results have you had from your demining program?

- Have you used any of the de-mining videos? If so, which ones? If none, why not? Do you find them to be effective?

Medical Training
- Do you use the medical training module? If no, why not? If yes, how often?

- [if used] Which lessons do you use?

- [if not used] Who provides the medical training?

- Have you ever wanted to change a course?   Were you able to change it?

- Do you use any of the medical training videos? If so, which ones? If not, why not? Do you find them to be effective?

Mine Awareness Training

- Do you use the mine awareness training lessons? If no, why not? If yes, how often?

- Have you ever wanted to change a lesson?   Were you able to change it?

- What kind of results have you had from your local mine awareness program?

Mine Facts

1. Used ? How used?

2. To develop de-mining training? Mine awareness materials?

3. How often do you use it?

Images
1. Used? How do you use them? Do you find them helpful?

2. Do you use them for each lesson?

3. How often do you use them?

4. Which ones do you use?

Practical Exercise Cards
1. Used? How do you use them? Do you find them helpful?

2. Do you use them for each lesson?

3. Do you use them to evaluate students?

4. How often do you use them?

Navigation
1. Can you find what you're looking for in the DSS easily?

2. How would you organize it in a better way?

Content Manager (Not in DSS2)
1. Used ? What uses have you found for it?

2. Have you used it to organize materials?

3. Is it easy to use?

4. How often do you use it?

General Training Questions:
- Where do you usually teach? Can we see the classroom?

- How many classes do you teach in a year? How many students? Who are your students?

- Can we see training materials that you currently use? How were these created?

- What do you do to prepare for a course and deliver it?

- What other materials do you use to prepare for a class?

- How helpful is the DSS to you as an instructor?

- Have you ever trained someone else to use the DSS? Is it easy for a new person to use?

- Has the DSS changed the way you train?

Transport:

- Have you ever had to transport the DSS? Tell me about that. Was the weight a problem? Were there other safety issues?

- Have you ever had to assemble the DSS? Tell me about that. (Ask about connecting cables)

Supplies and Maintenance:

- Have you had to put in any new ink cartridges or other supplies in the DSS? Why and was it difficult to do?

- Have you had to buy supplies? Tell me about that. (Expensive?)

- Where did you get your supplies? (How hard to get?)

- Have you ever had to repair the DSS or some part of it? Tell me about that.

General Questions

- What language is your system in? Would you like to see more languages in the system? Is it important to have local languages in the course content? In the software applications?

- Have you used the DSS User Guide? Have you ever used the User Guide when you've had a problem? (If so, what kind of problems were they?) How often do you use the User Guide? Has it help you to resolve a problem?

- Have you ever experienced a power outage while working on the DSS? Tell me about that.

- How would you change the system? If you could add a new feature, what would it be?

- What part of the DSS is least useful? Most useful?

Guatemala only:
Have you used Orbis? What uses have you found for it? Have you used it to develop de-mining training? Have you used it to develop mine awareness materials? How often do you use it?

Specific components and features:

    A. **Small Color Printer**
    1. Used? Approximately how many copies have you made? How did you use it? To develop handouts?

    2. Used for training de-miners or for mine awareness in the community?

    B. **Poster Printer**
    1. Used? Approximately how many printouts have you made? What types of posters did you make?

    2. Used for training de-miners or for mine awareness in the community?

    C. **Color Scanner**
    1. Used ? How used? To develop posters? Handouts? Video images?

2. How were the items developed used (i.e., de-mining training, local population mine awareness, other)? (Get a sense of which uses are common and which are less common.)

D. **<u>Digital Camera</u>**
1. Used? How used? What types of photos have you taken and how have you used them?

2. How often used?

3. Do you use the Kodak software? Do you find the software easy to use?

4. What kinds of changes do you make to the photos?

E. **<u>Heat Press</u>**
1. Used? How many T-shirts (or other items mentioned) have you created? What uses?

2. How have they been used?

V.   Scenarios.

Goal: To get an opportunity to watch the user interact with the system.
Ask the interviewee to talk aloud or explain as s/he demonstrates the use
of the system.

> *"I would like to switch gears now. A primary goal of this
> assessment is to understand how experienced people use the DSS.
> It's very important that we understand how it is used in real world
> situations. What I'd like to do is for you to describe a scenario in
> which you are using the DSS, and have you walk me through it,
> showing me exactly what you would do in that situation."*

Note:
- unexpected uses of the system
- "workarounds" that have been developed
- points of confusions
- false starts
- etc.

Examples (but try to use one that was previously stated):

- As they are demonstrating the stages they go through, ask them if this is their
  normal procedures and do they wish there was a different way to do it? Do
  others go through the same stages as they do?

- Imagine you have to update the materials for the medical training course you just told me about. What would you do? Can you show me?

- Imagine you are in the middle of a local mine awareness project and have several posters to create. How will you approach that? Will you show me?

- Imagine you recently updated one of the de-mining lessons with some new images of mines. Will you walk me through that? Show me how you did that.

Conclusion

- Final question, thank them for their time, verify contact information

    "Is there anything we didn't ask you that you think we should know about?"

      "Thank you very much for your time. We know you must be exhausted…"

      "May we contact you if we have any additional questions?