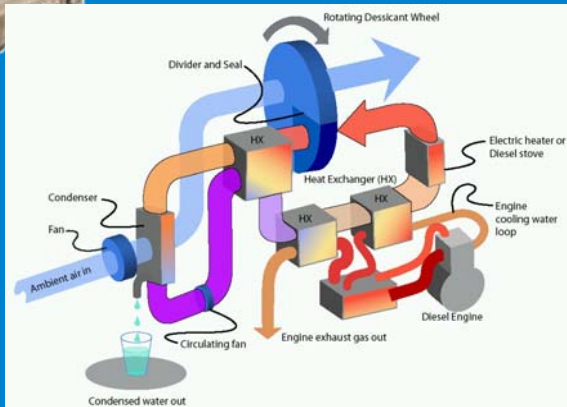


Water from Air



Purpose:

- Develop capability to produce drinking water by harvesting water from humidity sources, including atmosphere & vehicle crew compartments

Product:

- Lightweight, energy efficient device to generate and treat water from air for small units or platform integration

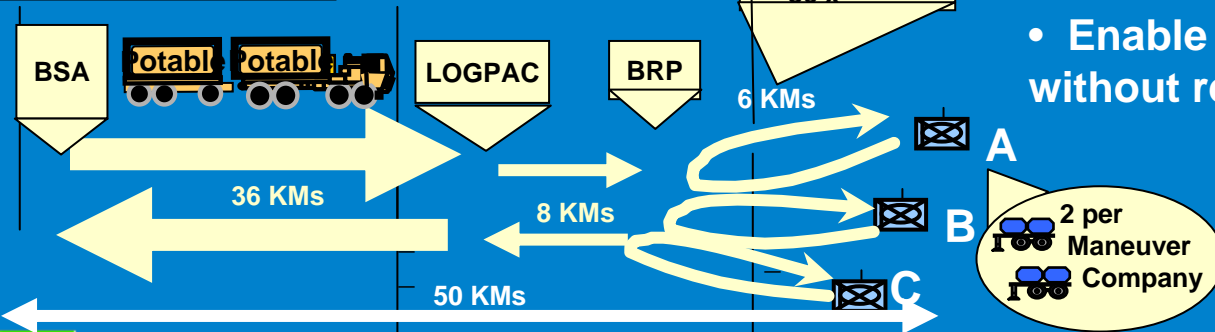
Payoff:

- Reduce the logistical footprint associated with water storage and distribution
- Enable soldiers/systems/units to operate without re-supply for 72 hours

Water Support Section
LWP
1x T1W PS
5x
12x Total Personnel

Provide 25,000 gpd for 3,600 soldiers

Unit Water Storage
Total: 36 x



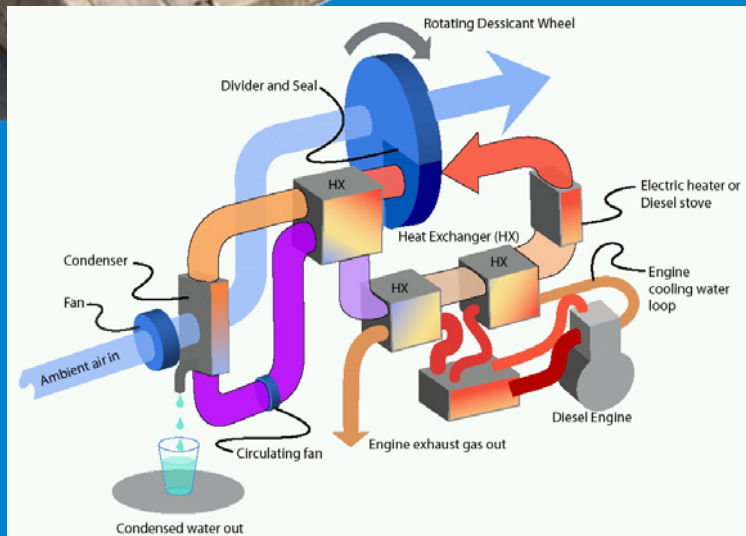
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Water from Air Challenges



Problem:

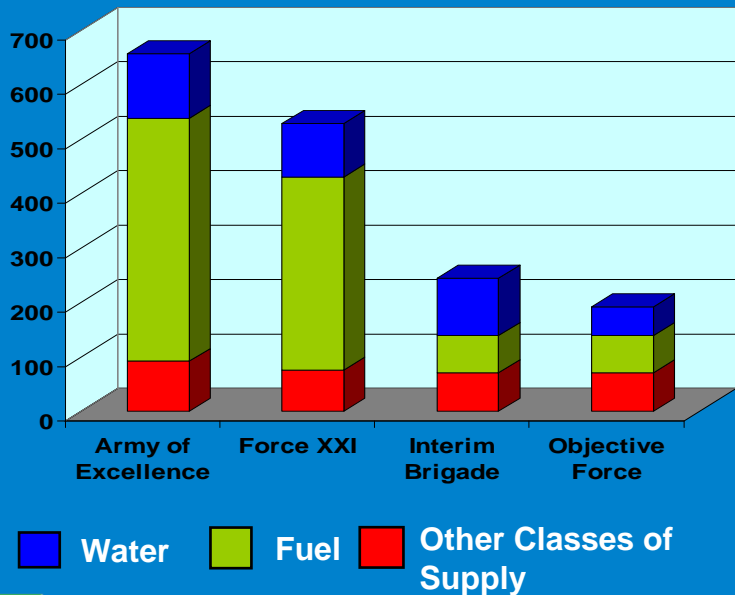
A soldier requires 4.1 gallons (34 pounds) of water per day projected to account for 30% of the Objective Force daily sustainment requirement.

What are the technical barriers to this problem?

- Large energy requirements associated with condensing water from vapor due to the dilute concentration and purifying water.
- The size and weight of current state of the art water collection, condensing and treatment technology.

How will you overcome those technical barriers?

- Solid and liquid humidity concentration technologies
- Low parasitic energy vapor collection techniques such as ambient condensation, absorption, facilitated transport
- Development of energy recovery and management technology



Water from Air Accomplishments



FY05 –FY06 Accomplishments

- Mesosystems demonstrator produced 2 gallons of water per gallon of fuel at a production rate of 0.5 gallons per hour
- Completed thermodynamic modeling of concentration and condensation cycles under a range of environmental conditions
- Hamilton Sundstrand scaled demonstrator operated at Jun 05 program review.
- Honeywell completed laboratory demonstration of sorption cooling based system.
- Hamilton Sundstrand selected in Jul 05 to design HEMTT Demonstrator.
- Joint program established with FCS LSI Interoperability Kit IPT.

Planned Accomplishments: FY06- FY07

3QFY06:

- HEMTT Demonstrator fabrication

4QFY06:

- HEMTT Demonstrator participates in Tactical Wheeled Vehicle Platform System Demonstration
- HEMTT Demonstrator testing and technology fly-off at ATC.

3/4QFY07:

- Demonstrator testing and evaluation in a relevant environment.
- Design and development of a more mature system



Joint FCS LSI - TARDEC Approach

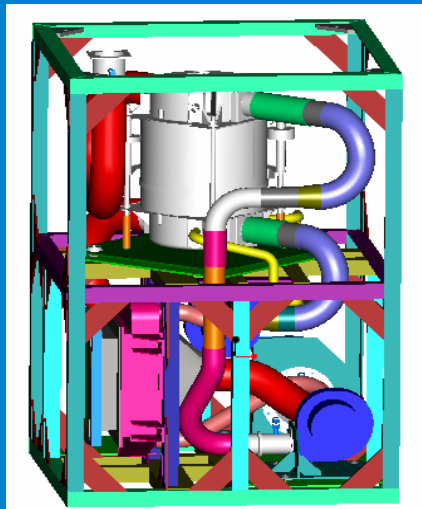
- TARDEC continues development and environmental chamber testing of skid mounted units
- TARDEC accelerates HEMTT-mounted, SOLID desiccant demonstrator schedule for a system delivery date of 4QFY06
- LSI adjusts HEMTT-mounted, LIQUID desiccant demonstrator schedule for a system delivery date of 4QFY06
- TARDEC and LSI develop HEMTT mounted system requirements to be used on both systems
- Both systems participate in TWV Platform System Demonstration and follow on testing at Aberdeen Proving Grounds
- Select the most promising technology approach
- TARDEC and LSI partner to fund development and testing of integrated HEMTT system program

System Development History



Stand-alone Breadboard Demonstrator

- TRL 5, demonstrated water collection
- Exploratory test bed
- Recovered 2 gallons of water per gallon of fuel
- Displayed at AUSA and AUSA Logistics, FY05 – FY06
- Modified demonstrator producing 5 gallons of water per gallon of fuel ready for testing



Vehicle Integrated Breadboard Demonstrator

- TRL 5, completed laboratory testing of system components
- Designed for integration into HEMTT platform
- Goal of 7 gallons of water per gallon of fuel
- Demonstrator in 4QFY06