

Robotics for Worker Safety in DOE-EM

- DOE-EM is responsible for decommissioning and cleanup of several legacy nuclear sites
 - Tasks and environments are hazardous and challenging



Robotics for Worker Safety

- Complexity of tasks precludes full automation
- Remotely operated robots can keep workers away from hazards
- Wearable robots can reduce acute or repetitive motion injuries



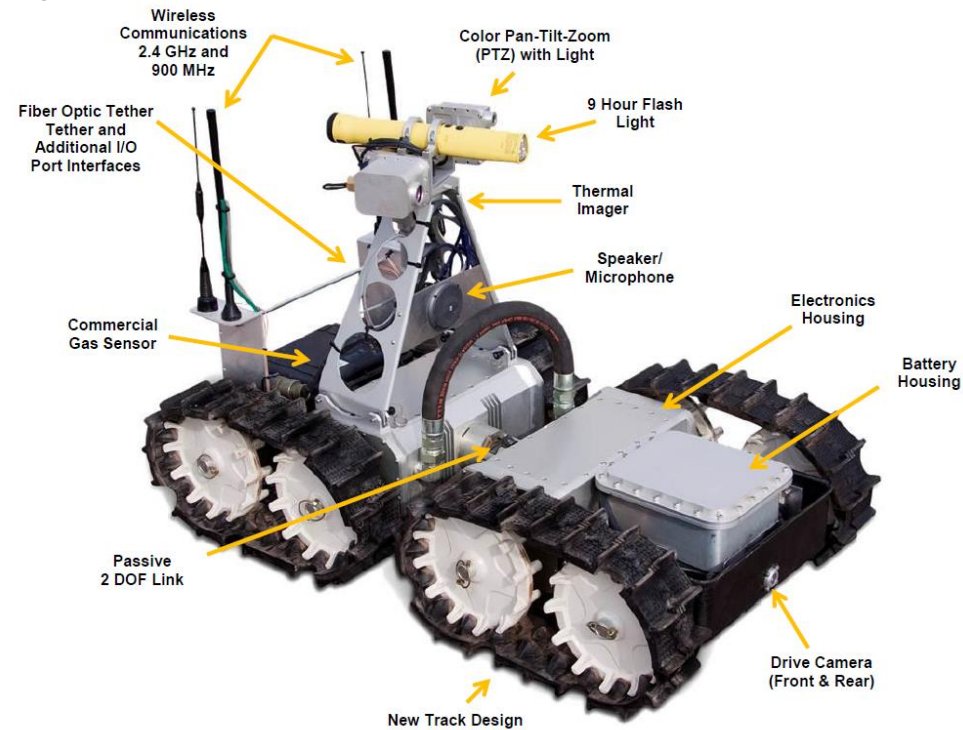
Gemini Scout Mine Rescue Robot

Features

- Extreme mobility
- Fully operational in ~18 in of water
- Explosion-proof housings
- PC-based control interface
- Pan-tilt-zoom color and IR camera
- 2-way radio and lighting
- Gas and temperature sensors
- I/O for adding payload and sensors

Applications

- Search and rescue missions
- Border tunnels
- Payload deployment and delivery
- Intelligence, surveillance and reconnaissance
- Support to first responders in unknown and dangerous situations



USW Workers at Portsmouth –Cylinder Inspection

- Storage cylinders need to be inspected regularly
 - Check number
 - Inspect valve
 - Swab surface
- Inspectors receive the highest radiation dose at the plant
- Teleoperated robots allow this task to be done with safe standoff



USW Workers at Portsmouth – Pipe Crawling Sandia National Laboratories

- NDA workers must check MILES of pipe for contamination
- Radiation levels require substantial PPE and spaces are hard to access
- Teleoperated pipe-crawling robots can traverse pipes looking for deposits
- Video feed to operator can be augmented by machine learning to point out potential deposits for further inspection

