Appendix E-1

Résumés

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EXPERIENCE SUMMARY

Registered professional engineer with 30 years experience in performing and managing complex environmental programs encompassing design and construction of environmental remediation and restoration projects on sites contaminated with hazardous materials, explosives, low level radioactive wastes, chemical warfare agents and unexploded ordnance, and in performing and managing complex environmental programs including chemical agent demilitarization, hazardous waste storage, site remedial investigations, environmental impact assessments, environmental audits, water supply, and wastewater treatment and disposal. Directly responsible for performance of remedial actions, development of management plans, supervision of professional staff members, direction of contractors, preparation of reports and designs, and assurance of high quality in all products. Formed and led professional teams to accomplish numerous small and large scale environmental projects and is familiar with the requirements of RCRA, CERCLA, TSCA, NEPA, CWA, SDWA, and other environmental statutes.

REGISTRATIONS/CERTIFICATIONS

Professional Engineer, Environmental - GA, No. 20959, 1/5/94
Professional Engineer, Environmental - SC, No. 15933, 1/26/94
Professional Engineer, Environmental - NC, No. 19934, 3/11/94
Professional Engineer, Environmental - MI, No. 6201041860, 10/31/96
Professional Engineer, Environmental - FL, No. 48003, 6/2/94
Professional Engineer, Environmental - AL, No. 19713, 11/19/93
Professional Engineer, Environmental - MD, No. 11688, 12/1/90
Certified Hazardous Materials Manager (Master) - US, No. 2538, 8/15/79
Professional Engineer, Environmental - WV, No. 13293, 2/28/97
Professional Engineer, Environmental - MS, No. 12496, 2/9/95

EDUCATION

MS / Environmental Engineering / University of North Carolina / 1971
BS / Chemical Engineering / University of Illinois / 1968

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1990
8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training - 1991
8-Hour OSHA Hazardous Waste Health and Safety Refresher Course - 1996
CPR and First Aid Training - 1993
DoD Security Clearance (Secret)* (Top Secret Eligible)

DISCIPLINE(S) (Y = Primary Indicator; N = Secondary Indicator)

Administrative	N
Chemical Engineers	Y
Ecologists	N

LOCATION

Company: Foster Wheeler Environmental Corporation; 1/15/90 - Present
Years w/Other Firms: 22
Present Location: Huntsville, AL
Daytime Phone: 205-830-4100

REPRESENTATIVE PROJECT EXPERIENCE

Manager of Ordnance Programs - Develops, directs and supervises the programs and projects for investigation and remediation of explosives and unexploded ordnance. Directs and oversees the development of technologies, methods and procedures for efficient, effective investigations of unexploded ordnance, evaluation of risk from explosives and unexploded ordnance, supervises the development of plans and procedures for safe, efficient remediation of explosive and unexploded ordnance contaminated sites, and supervises the execution of these projects and programs. He has expanded these programs into new technical approaches, increased business size due to client satisfaction, and maintained an accident free program.

U.S. Army Corps of Engineers, Aberdeen Proving Ground UXO RAC, Baltimore District, Maryland, Program Manager - Currently completing the remedial action project. Has developed and led the program staff to accomplish remedial actions at a number of unusual sites where unexploded ordnance, chemical agents and low level radioactive waste were present. Multiple simultaneous DOs were uniformly accomplished below initial cost estimates on or ahead of schedule by a team of up to 60 people. Although these projects included substantial risks, there have been no lost time or reportable injuries in more than 100,000 hours of operations. These projects have uniformly been accomplished below initial estimates and on or ahead of schedule. Has achieved a high level of client satisfaction, resulting in 90-95% award fee determinations.

Huntsville Operations, Manager of Operations – Prior to this assignment, was the Manager of Operations for Foster Wheeler's Huntsville Operations. Was responsible for the technical quality, administration, and contract management for numerous projects performed or managed by the Huntsville office. These projects included hazardous waste studies and remedial designs, environmental impact statements, explosive ordnance studies and designs, wetlands evaluation, underground storage tank management planning and remedial actions, RCRA closure certifications, environmental compliance auditing, wetlands delineation, and oil spill prevention control and countermeasure plans.

Naval Air Station, Marine Corps Logistics Base, Jacksonville, FL, Albany, Georgia, Project Manager – Project manager for three remedial construction projects, two at the Naval Air Station (NAS) Jacksonville, Florida and one at the Marine Corps Logistics Base, Albany, Georgia. One of the projects at the NAS Jacksonville is the decontamination and demolition of an industrial wastewater treatment plant contaminated with heavy metals, cyanides, and acids. The project included decontamination of nine tanks and containment structures, cleaning (pigging) of over 30,000 feet of buried pipelines, and removal and disposal of asbestos contaminated materials from several structures and tanks. The second project at the NAS Jacksonville is installation of an interim recovery system for light nonaqueous phase liquids contaminated with PCBs and radioactive materials. The

project at Marine Corps Logistics Base, Albany involved installation of a RCRA cap over a PCB spill site, and excavation to clean site criteria and disposal of chromium contaminated soil from another site.

Camp Shelby, Closure Certification, Mississippi, Project Manager – Project manager for clean closure certification of an open detonation ground in the impact area at Camp Shelby, Mississippi. The closure required collection and analysis of extensive soil, sediment and water samples to completely characterize the site and determine which residual compounds might be present in concentrations above health-based standards. Alternate standards were developed and used to show the effectiveness of closure.

Relocation of Armaments on Chemicals, Rock Island and Redstone Arsenals, Project Manager – Managed the preparation of an environmental impact statement for the relocation of armaments and chemical missions from Rock Island Arsenal to Redstone Arsenal. The move entailed construction of four facilities valued at more than $50 million and relocation of more than 2,000 jobs. The project required detailed evaluation of ten sites and the impacts of the proposed action on the physical and socioeconomic environment.

U.S. Army Corps of Engineers, Mobile District, Environmental Assessment, Project Manager – Was the Program Manager with responsibility for over 24 projects for the Mobile District of the Army Corps of Engineers. These projects, valued at over $8,000,000 included cultural resources studies, environmental assessments of installation master plans and natural resources management plans, wetlands evaluations, long term monitoring, environmental compliance assessments, and water supply engineering. Prepared recommendations for listing on the National Registry of Historic Places. Is responsible for overall management, contract negotiations, and federal contract compliance for all projects, and was the project manager for eight of the major projects.

Bridgeport Rental and Oil Services (BROS), Remediation Project, Deputy Project Manager – Deputy Project Engineer for the Superfund project at the BROS Site in New Jersey. This $100-million project involved the pumping, excavation, and incineration of PCB and dioxin contaminated oil and soils, removal and incineration of over 150 tons of contaminated debris, and removal and disposal of over 1,500 drums of unknown hazardous wastes. The project involved solutions to several complex environmental problems, including obtaining permits for incineration of hazardous waste, treatment and disposal of process water, and disposal of contaminated debris.

U.S. Army Corps of Engineers, Huntsville Division, Unexpolded Ordnance Studies, Program Manager – Program Manager for unexploded ordnance studies performed for the Huntsville Division of the U.S. Army Corps of Engineers. Managed three of the major projects involving delineation of unexploded ordnance contaminated areas, and remedial action designs, classified and open source archive searches, and planning for remedial investigations and removal actions, including UXO detection and clearance studies for former Camp Wheeler that required investigation more than 15,000 acres, identifying high probability UXO areas, detecting anomaly densities, and clearing 25-high density areas.

Miscellaneous Services of U.S. Military Operations, Various Titles – Prepared an Environmental Baseline Study for Marshall Space Flight Center. This study provided

general and background information for installation planners as the technical basis for evaluation of the impacts of proposed actions. This study evaluated all of the existing facilities, activities, and utilities on Marshall Space Flight Center, and interactions with Redstone Arsenal, the host organization.

Prepared a detailed environmental compliance training course for program managers at the Defense System Management College. This course was primarily based on the experiences gained and lessons learned during the Intermediate Nuclear Forces Treaty-PERSHING missile elimination experience, and used the PERSHING experience extensively, along with many others, to make the training particularly relevant to the program managers. Providing continuing support to the Army Missile Command in defining and evaluating technologies for deactivation/demilitarization of weapons systems while assessing the environmental impacts of these technologies.

Assisted SDB Protege firm to develop and use a craft labor pool that resulted in a 15% cost savings to client and achieved a 26% SDB utilization goal.

PRIOR EXPERIENCE

U.S. Army Corps of Engineers, Huntsville Division
November 1987-January 1990

Contracting Officer for the US Army Chemical Agent Demilitarization Program - Managed and directed development of acquisition strategies, contractor evaluation and selection, and contract performance. Provided executive supervision and contract management for the construction and equipment installation of the Johnson Atoll Chemical Agent Disposal System. Performed supervision of demilitarization operations for the non-lethal chemical agent BZ at Pine Bluff Arsenal, Arkansas and for the decontamination and decommissioning of the demilitarization facility. Provided contract management and supervision for the construction of the Chemical Agent Demilitarization Facility at Tooele Army Depot and the Chemical Demilitarization Training Facility at Aberdeen Proving Ground, Maryland. Also supervised design and equipment acquisition activities for all chemical demilitarization facilities in the continental United States. Responsible for coordination of construction and planning activities with regulatory agencies and political offices in the states of Oregon, Utah, Colorado, New Mexico, Kentucky, Indiana, Arkansas, and Maryland.

U.S. Army Corps of Engineers, Huntsville Division
May 1985 - November 1987

Contracting Officer for Environmental Programs - Managed the performance of contracted work for environmental programs supporting the US Army Training and Doctrine Command, US Army Materiel Command and Defense Logistic Agency. Responsible for contract management, technical supervision, and project success for over 300 environmental projects. Coordinated environmental evaluation, restoration and management activities with USEPA, regulatory agencies in the states of Alabama, Arizona, Arkansas, California, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Mexico,

North Carolina, Ohio, Oklahoma, Tennessee, Texas, South Carolina, Utah, Virginia, Washington, and Wisconsin, and local regulatory agencies in the areas affected by operation of Army and Defense Logistics Agency installations. The projects included field studies, decontamination and decommissioning of explosive production and loading facilities, planning for new and modified munitions production facilities, immediate response actions, policy development, installation support, design, environmental compliance auditing, remedial planning and design, permitting, and special contracting approaches to unique problems. Also involved UXO and hazardous waste design and construction including Initiated earliest UXO studies and removal designs for formerly used Defense sites and the clearance of UXO contamination of 5000 acres around OB/OD areas at Hawthorne Army Ammunition Plant. Managed and directed the inventory efforts for the Defense Environmental Restoration Program. Directed the development of inventory procedures, generic plans, and report formats, and chaired the review committee for findings and determinations of eligibility.

US Army Quartermaster School
May 1981-May 1985

Chief of Water Supply Branch in Directorate of Combat Developments - Developed doctrine, planning factors, equipment requirements and training requirements for Army water supply units. Designed the water supply units for transition from Engineer organizations to Quartermaster Organizations.

U.S. Army Environmental Hygiene Agency
May 1977- May 1981

Chief of the Water Quality Engineering Division - In this position, was responsible for development of personnel, budgets, and annual plans, policy and management plans, supervision of professional staff members, preparation of reports and designs, and assurance of high quality in all products. Supervised the performance of studies for explosive and propellant contamination from Army munitions manufacturing and loading facilities. Responsible for the coordination of environmental programs with regulatory agencies in all of the 5o States. During the intense efforts of the Army Pollution Abatement Program he provided direct leadership of technical data collection efforts, cost estimating, and prioritizing of projects at Army installations worldwide. This $100-Million program aimed to achieve environmental on an accelerated basis.

Various Assignments, US Army
July 1968 - May 1977

Prepared the first installation environmental assessments for U.S. Military communities in Europe. Those assessments described the environment, setting, missions, and status of activities affecting or potentially affecting the environmental, and established the standard for subsequent assessments.

Managed and performed numerous field investigations and studies of domestic and industrial wastewater in the United States, Europe, and Asia. These assignments included monitoring of natural waters and waste streams, characterizing wastewaters, designing operational enhancements, training operators, negotiating with regulatory agencies, and

predicting health and environmental effects to water quality. Experienced in the design and evaluation of industrial wastewater treatment systems, and in devising techniques to minimize wastewater and hazardous waste generation.

Project manager for detailed studies of numerous munitions manufacturing facilities to determine sources and extent of wastewater contamination, develop methods of reducing contamination from propellant and explosive manufacturing, and from load assemble and packing operations. Created detailed inventories of production facilities and recommended actions to improve operations and reduce generation of wastes.

EXPERIENCE SUMMARY

Mr. Paulus has been involved in various phases of UXO projects for approximately ten months. He is currently assigned as a Delivery Order Manager for UXO projects under the Fort McClellan contract with the US Army Engineering and Support Center Huntsville (USAESCH), Alabama. His primary responsibility is for the Ordnance and Explosives Disposal Support and Processing Delivery Order at the Fort McClellan site. Additional responsibilities include Assistant Delivery Order Manager for Reconnaissance and EE/CA phases of UXO projects and Coordinator/Instructor for Mountain Operations and Rescue Training.

Other areas of expertise include 19 years of Ordnance experience in Explosives Safety Programs, Explosive Ordnance Disposal (EOD) and Military Diving programs. This includes the organization and management of ordnance movements, EOD operations and classified research, test and evaluation for ordnance and diving programs. In addition, he has twenty-four years experience in photography specializing in underwater photography.

PROFESSIONAL AFFILIATIONS

Professional Association of Diving Instructors (PADI). 1987-Present.

REGISTRATIONS/CERTIFICATIONS

National Registry, Emergency Medical Technician-Basic (NREMT-B), April 2000. 218 hours.

TRAINING

Project Management 200 (PM200) – March 2001
Mountain Operations & Rope Rescue Instructor Training. 48 Hours. March 2001.
Hazardous Materials Operators course (HAZWOPER) 40 Hours. June 2000.
Wildland Fire Fighter. FFT-2. January 2000. 40 hours.
USAF Instructor Training Course. September 1996. 40 Hours.
International Association of Bomb Technicians and Investigators (IABTI)
Advanced Explosives & Terrorist Activities. May 1996
Improvised Weapons. March 1996.
IABTI Advanced Explosives & Terrorist Activities. February 1996.
FBI Post Blast Bombing Investigator. January 1996.
EES Blasting and Explosives Safety. November 1995.
Tactical Entry/Explosive Breaching. November 1995.
IABTI Advanced Explosives & Terrorist Activities. October 1995.
EES Surface Blasting. September 1994.
Tomahawk Cruise Missile Recovery Operations. August 1994.
Navy rappelling, fastrope and Special Insertion & Extraction Rig (SPIE). June 1992. 16 Hours.
Navy Helicopter Castmaster & Instructor. (Swimmer Deployment). April 1992. 40 Hours.
TEU Course 10/91
Naval Explosive Ordnance Disposal School. Indian Head, MD June 1991 2600 Hours.
(Certified as Master Explosive Ordnance Disposal Technician).
Surface Warfare Officer School (Shipboard Operations). August 1987. 480 hours.
Engineering Officer of the Watch (FFG-7 (LM-2500) gas turbine engines) Operators Training Course.
September 1987. 320 hours.

Navy Pilot and Shipboard SAR Swimmer & Instructor. September 1981. 80 Hours.
Navy Air and Mixed Gas Diving and Salvage Schools. 1976-480 Hours. 1982-680 Hours.
Trained and qualified to operate and maintain ships/boats from 6 to 450 feet in length.

EDUCATION

BS Political Science with Russian Studies Certificate (Minor), 1987 - Oregon State University.

REPRESENTATIVE PROJECT EXPERIENCE

US Army Engineering and Support Center Huntsville (USAESCH); Fort McClellan Ordnance and Explosive Response – UXO Site Characterization, DACA87-99-D-0010, Fort McClellan, Anniston, Alabama, Delivery Order Manager; 10/00-Present.

Responsible for all phases of the OE Disposal Support and Processing Delivery Order including development of technical approach, proposal preparation, budget negotiation, project initiation and project execution.

Developed and implemented Mountain Operations, Rope Rescue and First Aid Training for Fort McClellan site personnel. Program is designed to work on a worldwide basis, emphasizing safety while maintaining productivity. In addition, he developed a first aid backpack system that is being used as a model for company wide first aid systems. His innovative approaches have resulted in positive comments from regulators and clients.

US Army Engineering and Support Center Huntsville (USAESCH; Savanna Army Depot, Savanna, Illinois; UXO Technician II. 06/00-11/00

UXO Technician II for Engineering Evaluation and Cost Analysis (EE/CA) at the Savanna Army Depot.

PRIOR EXPERIENCE

Naval School Explosive Ordnance Disposal, Detachment, EGLIN AFB, Florida.

Assistant Training Officer, Explosive Safety Officer, and Diving Officer. 07/96-4/98.
Responsible for the training of U.S. and foreign armed forces (includes 33 NATO and Non-NATO countries), selected civilian officials and Federal agencies. Responsible for the Command's explosive safety, inert ordnance and diving programs. Supervised 71 personnel.

EODMU THREE Detachment Point Mugu, California.

EOD Officer in Charge. 06/94-06/96. Provided EOD emergency response/support for RTD & E projects, demolition services and Fleet programs for Naval Air Warfare Center, Weapons Division, Naval Air Weapons Station, law enforcement agencies within Santa Barbara,

Ventura, Los Angeles and Orange counties, and government agencies including DOD and the U.S. Secret Service. Explosive Safety Officer. Managed $3,300,000 in facilities and specialized equipment and an operating budget of $450,000. Accomplished 430 complex and hazardous Explosive Ordnance Disposal and Diving operations in support of priority one test and evaluation involving United States and foreign weapons systems. Encountered: Improvised Explosive

Devices (IED's), special projects systems, missiles, projectiles, grenades, aircraft systems, dispensed munitions, torpedoes, undersea mines and structural demolition. Supervised 11 military and 1 Civil Service personnel.

EODMU NINE, Mare Island, California.

EOD Officer in Charge. 06/94-06/96. Mine Counter Measures detachment. Provided EOD and Mine Countermeasures services in support of Pacific Fleet operations and exercises worldwide and ashore throughout the Northern United States and the Seventh Fleet AOR. Conducted joint operations and training of and with EOD units from Thailand, Indonesia and Japan. Encountered: IED's, bombs, grenades and undersea mines. Supervised 7 personnel.

EODMU NINE, Mare Island, California.

EOD Officer in Charge. 07/91-09/92. Shipboard response detachment. Provided EOD services in support of Subic Bay Naval Station base closure and ammunition relocation. Organized/Supervised US and foreign EOD and Salvage teams during 38 continuous hours of dewatering and the ordnance offload of a damaged and flooded United States warship. Encountered: IED's bombs, grenades, projectiles, missiles, special weapons and chemical munitions. Supervised 4 personnel.

USS Reuben James (FFG-57)

Ordnance Officer. 05/88-07/90. Responsible for weapon systems, ordnance management, explosive safety program and shipboard security team training. Planned and implemented major ordnance onloads/offloads without incident. Developed and implemented shipboard security training program. Qualified as a Mixed Gas Diving Officer. Supervised 26 personnel.

Naval Ocean Systems Center (NOSC), Point Loma, San Diego, California

Salvage Diver, Mixed Gas. 10/82-08/84. Member of 11 man dive team. Accomplished 320 diving operations involving classified research and development projects.

Oregon State University, Corvallis, Oregon

Student. 08/84-03/87. Selected for Enlisted Commissioning Program. (Enlisted to Officer commissioning program).

USS Brunswick ATS-3, Pearl Harbor, Hawaii

Salvage Diver. 02/77-05/79. Member of shipboard dive team.

Miscellaneous

Photographer. 06/77-Present. Specialized in underwater photography. Experience includes documentation of marine mammals, underwater shipboard hull inspections and wrecks. Work has been displayed in West and East Coast art galleries.

PROFESSIONAL REFERENCES

Fort McClellan, Alabama
Mr. Jack McIlrath

FWENC
Bldg. 698 Seaton Avenue
Ft. McClellan, AL 36205
(256) 820-7904

Savanna Army Depot, Savanna, Illinois
Mr. James Cocchiola
FWENC
Bldg. 698 Seaton Avenue
Ft. McClellan, AL 36205
(256) 820-7904

Explosive Ordnance Disposal
Captain William Wright, Commodore

Explosive Ordnance Disposal Group One
2424 Rendova Road
Coronado, CA 92315
(619) 437-0726

DISCIPLINES

Administrative (1)	N	
Photo Expert	(101)	N
Training Expert	(103)	N
Political Scientist	(171)	N
Diver (177)	N	
UXO Technician	(199)	Y

SKILL SET

Unexploded Ordnance Project Manager
Unexploded Ordnance Technician (UXO)
Mountain Operations
Rope Rescue
Diver
Photographer

LOCATION

Company:	Foster Wheeler Environmental Corporation; 6/19/2000 – Present
Years w/Other Firms:	None
Present Location:	Fort McClellan, AL
Daytime Phone:	(256) 820-7904

EXPERIENCE SUMMARY

Sixteen years of comprehensive occupational health and safety experience for private industry, consulting, and government. Manages and conducts audits of comprehensive health and safety programs for offices, hazardous waste sites and supervises project health and safety staff. Supervised governmental enforcement staff who determined compliance with New Jersey asbestos regulations. Performed industrial hygiene surveys of operations involving asbestos, lead, heat stress, indoor air pollution, metals, noise, silica dust, and volatile organic compounds. Conducted health and safety training programs for air monitoring, asbestos, lead, hazardous waste, and respiratory protection.

PROFESSIONAL AFFILIATIONS

American Industrial Hygiene Association - National
American Academy of Industrial Hygiene

REGISTRATIONS/CERTIFICATIONS

Certified Comp. Practice. Industrial Hygiene - US, No. 5826 Dates: 01/01/1999 - 12/31/2005
Certified Instructor for 10- and 30-Hour Construction Safety (OSHA 500) - 1996
Certified NIOSH 582 Asbestos in Buildings: Air Sampling and Analysis - 1995
Completed New Jersey Lead Inspector/Risk Assessor Course- 1997
Completed New Jersey Lead Supervisor Course- 1998
Completed New Jersey Asbestos Supervisor Course- 1998

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1987
8-Hour OSHA Hazardous Waste Health and Safety Supervisor Training - 1992
8-Hour OSHA Hazardous Waste Health and Safety Refresher Course - Current

EDUCATION

BS / Environmental Science / Cook College, Rutgers University / 1983

REPRESENTATIVE PROJECT EXPERIENCE

Foster Wheeler Environmental Corporation; Livingston, NJ; 3/30/87 - Present

Health and Safety Manager – Responsible for project management of health and safety staff; management, development and auditing of comprehensive health and safety programs, and oversight of subcontractor health and safety programs. Instructor in corporate health and safety training programs.

New York City Department of Transportation (NYCDOT); Manhattan Bridge – Developed lead compliance program and respiratory protection program for inspectors overseeing the Manhattan Bridge reconstruction project. Also conducted the lead training program and respiratory protection training for the inspectors. Other contributions included reviewing and consultation for the NYCDOT regarding the general contractor's lead compliance program and development and oversight of an ambient air monitoring program lead emissions during construction activities in proximity to a public school.

Brooklyn Navy Yard; Brooklyn Navy Yard Cogeneration Partners, L.P.; Site Manager – Responsible for this oversight project involving construction safety during demolition activities, asbestos abatement, lead abatement, and environmental impact statement compliance. Duties include providing consultation and review of contractor safety programs, asbestos safety plan, and lead compliance plan. Also provided consultation and direction regarding hazardous waste disposal and diving safety.

Agip S.p.A.; Trecate Remediation Project; Italy – Developed Health and Safety program for the Trecate remediation field activities. Also conducted training of Italian personnel responsible for implementing and supervising the health and safety program in the field. Performed health and safety inspections during remedial construction activities. Currently updating the HASP to incorporate bioventing and bioslurping activities.

Agribusiness Technologies; Times Beach Remediation – Developed the site-specific health and safety plan (HASP) for this long-term remediation project. Developed and initiated a comprehensive health and safety program at the site. Hired and trained site health and safety officers to implement HASP and to ensure subcontractors conform to program requirements.

ARCO; Sinclair Refinery Site Remediation – Developed Health and Safety Plans for landfill remediation activities such as drum removal, excavation, soil stabilization and construction of a slurry wall and closure cap. Implemented on-site health and safety program for landfill investigation activities such as drilling, soil sampling, groundwater sampling, and sludge removal.

U.S. Army Corps of Engineers; Bridgeport Rental and Oil Services (BROS) Remediation – Directed a comprehensive on-site health and safety program at this 50-worker site. Supervised a nine-person health and safety staff, including health and safety technicians, meteorologists and a decontamination technician. Duties included direction of an extensive on-site program for real-time air monitoring, personnel and perimeter air monitoring, and off-site air monitoring. Conducted thorough site-specific training and managed health and safety training and medical monitoring program.

New Jersey Department of Environmental Protection; Burnt Fly Bog Upland Remediation – Directed comprehensive on-site health and safety program. Included was supervision and training of health and safety technicians, design and implementation of a personnel air monitoring program, and conducting site-specific health and safety training. Also, gave presentations at public meetings for the NJDEP in response to concern regarding off-site emission.

U.S. Environmental Protection Agency; Wells G&H Site – Developed and implemented on-site health and safety program. Included real-time monitoring, site-specific training, and monitoring and maintenance of medical and training records.

Manufactured Gas Plant (MGP) Sites; New York and New Jersey – Developed the site-specific health and safety plan (HASP) for numerous MGP projects including the Boonton Coal Gasification Site, Dover Coal Gas Site (New Jersey) and the Glens Falls MGP Site (New York). The activities onsite included monitoring well installation, test pit excavation, groundwater, soil, sediment, and/or air sampling, air quality surveys, etc. Has also supported the HSO's on field assignments at the Atlantic Highlands Former MGP Site (New Jersey) and at the North Albany and Troy (Smith Avenue) Former MGP Sites (New York).

PRIOR EXPERIENCE

New Jersey Department of Labor
Office of Asbestos Control and Licensing
Trenton, NJ

Occupational Health Consultant – Supervised the field staff who conducted inspections to enforce the New Jersey Asbestos Control and Licensing Act. Duties included determining whether contractors seeking licensure had adequate work practices and an adequate respiratory protection program. Other duties included developing and administering a respiratory protection program for the field staff and providing consultation to the public on all matters pertaining to asbestos.

New Jersey Department of Health
Occupational Health Program
Trenton, NJ

Program Specialist – Conducted investigations to identify, measure and evaluate employee exposures to potentially harmful agents and preparing industrial hygiene reports containing findings, conclusions and recommendations. Participated in training programs for employees and health professionals on occupational health matters. Other duties included repair, maintenance and calibration of equipment utilized for workplace monitoring.

Johnson and Johnson Products
North Brunswick, NJ

Industrial Hygiene Technician – Identified, measured and evaluated employee exposures to potentially harmful agents, and industrial hygiene report writing. Responsible for the maintenance and calibration of instruments employed for workplace monitoring and preparation of samples for laboratory analysis.

Ethicon
Somerville, NJ

Industrial Hygiene Technician – Assisted the industrial hygienist in identifying, measuring and evaluating employee exposures to potentially harmful agents. Other duties included maintenance and calibration of instruments employed for environmental monitoring, preparation of samples for laboratory analysis and maintenance of employee exposure records.

LOCATION

Company: Foster Wheeler Environmental Corporation; 03/30/1987 - Present
Years w/Other Firms: 5

Present Location: Livingston, NJ
Daytime Phone: 973-597-7101

DISCIPLINE(S) (Y = Primary Indicator; N = Secondary Indicator)

Environmental Scientists	N
Industrial Hygienists	Y
Project Managers	N

EXPERIENCE SUMMARY

Master Explosive Ordnance Disposal Technician with 23 years in the United States Navy Explosive Ordnance Disposal (EOD), and industrial safety programs. Proven performance in EOD operations, planning, and administration. Extensive experience in ordnance clearance and diving operations, health and safety programs, explosive safety programs, and ammunition procurement, storage, and shipment.

REGISTRATIONS/CERTIFICATIONS

UXO Specialist, Explosives/Blasting, VA

TRAINING

40-Hour OSHA Hazardous Waste Health and Safety Training - 1993
8-Hour OSHA Hazardous Waste Health and Safety Supervision Training - 1993
Advanced First Aid and CPR - Current
CHEMRAD USRAD Training - 1/97
Alabama Blasters Certification- 5/200
Virginia Temporary Blaster - 6/96
DOT/HM-126F Hazmat Training 49 CFR 172, Subpart H - 1996
USACE Quality Control Engineering Course - 1996
G-822L Portable Cesium Magnetometer Certification - 9/94
Corporate Health and Safety Officer Training - 1994
Field Method, TNT/RDX Detection Analysis Certification Training - 1994
Building Construction Technology, Gulf Coast Community College - 1983
Project Manager Course and Executive Problem Analysis and Decision Making, American University - 1980
EOD Refresher Courses, Biannually - 1966-1977
Explosive Hazards Control; Industrial Safety; Industrial Hygiene; Explosive Safety and Hazard Analysis; and Ammunition Storage and Handling, Indiana University - 1973
Vietnamese Language, Department of the Army - 1968
Basic EOD Training at NAVSCOLEOD - 9/63
Naval Underwater Swimmers School, Naval Station - 3/63

EDUCATION

Building Construction Technology, Gulf Coast Community College, 1983
Executive Problem Analysis and Decision Making, American University, 1980
AA, Arts and Sciences, Charles County Community College, 1978
Explosive Hazards Control, Indiana University, 1973

REPRESENTATIVE PROJECT EXPERIENCE

Foster Wheeler Environmental Corporation; 08/94-Present

Project Manager and Superintendent for UXO projects and Health and Safety Officer for hazardous and toxic waste projects.

Ordnance and Explosive Response, Fort McClellan, AL; Senior UXO Supervisor, Site Manager and Health and Safety Officer 01/00-Present - Responsible for conducting archive search, plan preparation, surface UXO clearance, geophysical survey, and intrusive sampling of unexploded ordnance on Fort McClellan, pursuant to the Base Realignment and Closure (BRAC) Program. Duties and responsibilities include: cordinating daily operating schedule with other agencies/contractors;

supervising UXO surface clearance activities; provide UXO escorts for all site personnel in uncleared areas; conducting EM-61 survey with USRAD system; supervising UXO excavation and investigation of selected anomalies; supervising UXO identification and disposition of located UXO items; requisition and storage of demolition materials; and ensuring that UXO phase for project is completed in accordance with plans and specifications.

Tabbs Creek Dredging and Remediation, NASA; Langley AFB, VA; 11/99-12/99- Health and Safety Officer during site mobilization, dredging and remediation of selected areas in Tabbs Creek and wetlands. Task included; Laying in 5 miles of access roads through marsh and wetlands, excavating soils contaminated with PCBs, staging, sampling and disposal of contaminated soils, backfilling areas of excavation and recovering all access road materials.

Landfill Removal And Repair Project, Melville, RI; 10/99 - Health and Safety Officer, Sample, excavate, characterize, ship and dispose of contaminated waste. Principle hazards included; radiological components, potential UXO items, arsenic, lead, PCBs, volatile and semi volatile organic compounds.

Landfill Repair Project, Brunswick, MA; 09/99 - Health and Safety Officer during onsite activities. Principle hazards included potential UXO items, arsenic, lead, PCBs, volatile and semi-volatile organic compounds.

Proposal Team, Fort McClellan, AL; 02/99-10/99 - Health and Safety Officer and member of team to prepare proposal, work plan, health and safety plan for a five year project involving the location, detection, removal/disposal of conventional and chemical munitions.

Former Raritan Arsenal, Edison, NJ; 03/99 - Senior UXO Supervisor and Site Manager during a geophysical survey and UXO investigation of selected sites..

Navy; F-4 Aircraft Crash Site, White Sands Missile Range, Holloman AFB, NM; Site Manager/Senior UXO Supervisor; 01/99-02/99 - Responsible for mobilizing personnel and equipment to crash site to locate, recover and dispose all hazardous material from the crash site.

Fort Dix; Edison, NJ; Site Manager/Senior UXO Supervisor; 12/98 - During the geophysical survey, and intrusive sampling, locating and disposal of unexploded ordnance on Fort Dix under the Base Realignment and Closure act.

Adak Naval Air Facility; Adak, AK; 09/98-10/98 - Senior UXO Supervisor/Emergency Cordinator, during UXO clearance of suspected minefields on Naval Air Facility, Adak Island, Alaska pursant to the Base Realignment and Closure (BRAC) Program. Duties and responsibilities include: Supervising UXO clearance, UXO identification and disposition of located UXO items. Responsible for requisition and storage of demolition materials.

Nomans Island Impact Range; Nomans Island, MA; Site Manager; 04/98-09/98-Site Manager during a surface UXO clearance and removal of all hazardous and non hazardous material from an island twenty two miles at sea.. Responsibilities included: Assist in work plan preparation, Ensuring compliance with local, state and federal regulations, Mobilizing personnel and equipment to New Bedford, MA. -Arranging and coordination for surface transportation of personnel and equipment from New Bedford to Nomans Island, Establishing mooring and landing facilities at Nomans Island, Establishing seven miles of roads on the island, Conducting UXO surface clearance of 624 acres, Removal of all debris from the island, Locating four underground storage tanks and removal of 12,000

gallons of fuel products from the island, Locating 14,000 UXO/UXO related items, Explosively venting 4,400 suspect UXO items and shipment of over one million pounds of OE/OE related material off island,

Former Camp Wellfleet, Cape Cod National Seashore Park, Wellfleet, MA; Site Manager/Senior UXO Supervisor; 12/97-04/98- Responsible for conducting archive search, geophysical survey, and intrusive sampling, locating and disposal of unexploded ordnance on Former Camp Wellfleet under the FUD program.

Nansemond; Former Army Ordnance Depot, Tidewater Community College, Portsmouth, VA; 10/97-11/97 - Senior UXO Supervisor, Site Superintendent, Health and Safety Officer and Quality Control Manager, during the completion of additional task for an EC/CA Study started 8/96..

Adak Naval Air Facility; Adak, AK; Site Superintendent, Senior UXO Supervisor, UXO Safety, UXO Quality Control, Site Emergency Coordinator, and SSHO during absence of assigned SSHO, 03/97-10/97 - Responsible for conducting archive search, geophysical survey, and intrusive sampling of unexploded ordnance on Naval Air Facility, Adak Island, AK, pursuant to the Base Realignment and Closure (BRAC) Program. Duties and responsibilities include: daily operating schedule; conducting daily safety briefs; supervising UXO surface clearance activities; provide UXO escorts for all site personnel in uncleared areas; conducting EM-61 survey with USRAD system; Chairman Anomaly Selection Committee; supervising UXO excavation and investigation of selected anomalies; supervising UXO identification and disposition of located UXO items; requisition and storage of demolition materials; and ensuring that UXO phase for project is completed in accordance with plans and specifications.

Nansemond; Former Army Ordnance Depot, Tidewater Community College, Portsmouth, VA; Senior UXO Supervisor, Site Superintendent, Health and Safety Officer, and Quality Control Manger; 10/96-03/97 - Responsible for an ECCA study. Duties and responsibilities included: provided basis of estimate for project operational phase; daily operating schedule included conducting daily safety briefs; supervised cutting and clearing activities; provided UXO escorts for all site personnel; coordinated scheduled activities of geophysical survey team; supervised UXO excavation and investigation of selected anomalies (1239); supervised UXO demolition operations to dispose of located UXO items; requisition and storage of demolition materials; and ensured that project was completed with plans and specifications.

Camp Wellsfleet; Cape Cod National Seashore Park, 12/96 - Member of a site visit team in preparation for development of an Engineering Evaluation/Cost Analysis for the site.

U.S. Navy; Port Hadlock Detachment Naval Weapons Station, Bangor, WA; Senior UXO Supervisor and alternate Health and Safety Officer; 08/96 -09/96 - Responsible for shoreline erosion remediation and capping of a landfill.

Lauderick Creek; Area UXO Removal Action, Edgewood Area, Aberdeen Proving Grounds, MD; 01/96 - 07/96 - Member of a team to prepare draft and final work plans for the mobilization, training, surveying, locating, excavating, identifying, removing, and disposing of potential UXO hazards and related waste. Responsibilities included: conducted archives search to define potential hazards associated with area; conducted site inspection to identify geographical features; and assisted in preparing Engineering Evaluation/Cost Analysis (EE/CA).

Environmental Remediation Services; Edgewood Area, Aberdeen Proving Grounds, MD; Senior UXO Supervisor/Health and Safety Officer; 02/95 - 07/96 - Significant assignments have included

Site Safety and Health Officer (SSHO) of various projects involved with locating, removing, sampling, storing, and disposing of potentially-contaminated material. Potential hazards of concern have included chemical, biological, physical, and UXO.

Chlorine and Experimental Plant Dump Sites, Edgewood Area, Aberdeen Proving Grounds, MD; Site Safety and Health Officer; 06/95 - 11/95 - Responsible for ensuring compliance with the SHERP during the sampling, locating, excavating, and removing of potentially-contaminated material (PCM) from an area where multiple chemical production plants, pilot plants, and chemical manufacturing plants operated from the WW1. The project involved the removal of 300 tons of PCM. All intrusive activities were conducted in level B PPE. Monitoring included the use of minicams, ICADs, DAAMs tubes, and standard air monitoring equipment. Potential hazards of concern were chemical, radiation, physical, biological, and UXO.

26th Street Radiation and UXO Removal Site, Edgewood Area, Aberdeen Proving Grounds; MD; Site Safety and Health Officer; 05/96 - 07/96 - Responsibilities included sampling, radiation monitoring, UXO removal operations, screening, and packaging of radiation-contaminated materials.

Stokes Avenue Dump Site, Edgewood Area, Aberdeen Proving Grounds, MD; Site Safety and Health Officer; 01/96 - 03/96 - Assisted in preparing basis of estimate and estimate for project. Responsible for ensuring compliance with the SHERP during the sampling, locating, excavating, and removal of PCM from an area where multiple chemical production plants operated from WW1. Potential hazards of concern were chemical, physical, biological, and UXO.

Pilot Plant Sumps, Edgewood Area, Aberdeen Proving Grounds, MD; Site Safety and Health Officer; 10/95 - Involved with sampling, pumping of sump contents, and filling of sumps with grout.

Building E-3640, Edgewood Area, Aberdeen Proving Grounds, MD; Site Safety and Health Officer; 11/95 - The project involved clearing and grubbing, sampling of soils and liquids, excavation of contaminated soils, sump pumping and backfilling, decontamination activities, and site restoration.

C-Field, Edgewood Area, Aberdeen Proving Grounds, MD, Site Safety and Health Officer; 06/95 - The project included sampling of soils and liquids, excavation of contaminated soils, and two abandoned septic systems.

U.S. Navy; Port Hadlock Detachment Naval Weapons Station, Bangor, WA; Senior UXO Technician; 06/94 - 07/94 - Involved in the UXO/OEW clearance of the open burn/open detonation (OB/OD) Areas 11 and 12.

J-Field, Edgewood Area, Aberdeen Proving Grounds, MD; Site Safety and Health Officer; 02/95 - 03/95 - Responsible for construction of a 275-foot gabion wall and rip rap shoreline protection system. Project involved clearing UXO, site clearing and grubbing, and excavation and construction of the shoreline protection system.

OU-1, NAS Jacksonville, FL; Site Safety and Health Officer; 04/95 - 06/95 - Responsible for the remedial action of a Navy Priority Listed site on the Navy Installation Restoration Program. Work activities included soil sampling, clearing and grubbing, excavating of contaminated soils, stockpiling contaminated soils, trenching and installing three ground water extraction systems, decontamination activities, and site restoration.

Raritan (Former) Army Depot; Raritan, NJ; 09/95 - Conducted a site visit to review 19 selected sites for possible remediation. Also conducted UXO escort for site visit in preparation for development of an EE/CA for the Arsenal.

Nansemond (Former) Army Depot; Suffolk, VA; Task Leader/Site Safety and Health Officer and UXO Escort; 04/96 - Responsible for a preliminary land survey in preparation for a UXO removal action.
Newport, RI; Senior UXO Supervisor; 06/96 - Responsible for power screening operation of 9,000 cubic yards of contaminated soils that also had three- and five-inch projectiles.

Nansemond (Former) Army Depot; Suffolk, VA; Task Leader/Site Safety and Health Officer/Senior UXO Supervisor; 06/96 - Responsible for a preliminary survey to estimate degree of cutting and clearing of 18 selected sites in preparation for a UXO removal action.

PRIOR EXPERIENCE

Conventional Munitions Systems Inc. (CMSI)
Chocolate Mountain Impact Range
El Centro, CA

Senior UXO Technician/Supervisor, 1/95-2/95 – The objective of the project was to clear an access 21.5 miles long by 75 feet wide by eight feet deep for the installation of a new gas line. Concept of operation was to conduct a visual surface sweep of the designated area followed by a towed magnetometer array, locating, and plotting magnetic anomaly system.

Explosive Ordnance Disposal World Systems Inc. (EODWSI)/Conventional Munitions Systems Inc. (CMSI), Kuwait

UXO Team Leader and Zone Manager, 2/92-10/93 – Involved in the post-war cleanup of Kuwait. Duties included mapping the area of operation and plotting located ordnance items with Global Positioning System (GPS), and pronavigation systems conducting land sweeps to located and dispose of hazardous munitions, reclaiming usable munitions, removing all vehicles, and restoring land area to pre-ware condition. Performed as UXO Team Leader for hands-on minefield clearance operation.

Florida, 1983-1992 – A licensed general contractor involved in government, commercial, and residential building projects.

Explosive Ordnance Disposal Detachment Naval Coastal System Center
Panama City, FL

Officer-in-Charge, 1977-1981 – Provided ordnance disposal services to the principal Navy activity for conducting RDT&E in mine countermeasures, antiship torpedo defense, diving and salvage, coastal and inshore warfare defense, and amphibious operations. Functional responsibilities included initiation, review, and approval of plans for the test/evaluation of explosive devices, diving equipment and systems, and explosive safety officer. Prepared technical reports and provided technical expertise to scientific and intelligence agencies in connection with the exploitation of foreign materials. Director of Safety for R&D activity.

Explosive Ordnance Disposal Group Two
Fort Story, VA

Operations Officer, 1974-1977 – Responsible for coordinating the assignment of EOD assets in the eastern United States, Europe, and Atlantic Fleet area of operations. Duties included:

Officer-in-Charge and Parachute Insertion Team, 1974-1977 – Responsible for a special team trained and equipped to respond to an EOD incident anywhere in the area of operation by parachute insertion.

Officer-in-Charge, Secret Service Support Team, 1974-1977

USS Seattle, Mediterranean Deployment, EOD Detachment, Officer-in-Charge, 1/76-7/76 – Completed surface warfare qualifications for deep draft vessels.

Suez Canal Clearance Operation, Senior Operational EOD/Diving Officer, 7/74-11/74

Operations Officer, 12/74-12/75 – Coordinated the assignment of EOD personnel and material assets in the eastern United States, Europe, and Atlantic Fleet area of operations. Initiated operations orders for special fleet and large ordnance clearing operations. Qualified surface warfare for deep draft vessels. EOD/Diving Officer for Task Force responsible for the Suez Canal Clearance.

EOD Detachment
Cecil Field, FL

Officer-in-Charge, 1970-1974 – Provided EOD services to a large military complex. Primary responsibilities included conducting periodic sanitation of four active bombing ranges to clear dud-fired munitions and performed as Explosive Safety Officer for all Naval Activities in the Jacksonville area of operation.

Explosive Ordnance Disposal Group One
Hawaii

1967-1970 – Completed three assignments in the Republic of Vietnam during combat operations.

NAVSCOLEOD
Indian Head, MD

1964-1967 – Primary instructor in explosive filler and filler identification, rockets and guided missiles, land mines and booby traps, and improvised explosive devices instructor. Duty station at NAVSCOLEOD Detachment, Eglin AFB, Florida. Performed practical application of basic EOD techniques covered at Indian Head, Maryland. All operations and procedures were performed on live explosive items.

USS Essex

Quonset Point, RI

EOD Team, 1963-1964 – Provided EOD services.

DISCIPLINE CODES

199 UXO Specialist, Y
109 Construction Experts, N

OTHER DATA

Office Location: Fort McClellan
FWENC Hire Date: 08/03/1994
Years w/Other Firms: 23
Daytime Phone: 256-820-7904

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EXPERIENCE SUMMARY

Mr. Saveall has over 12 years experience as a Military Explosive Ordnance Disposal Technician and an Unexploded Ordnance (UXO) Disposal Technician. His previous positions include a Master Explosive Ordnance Disposal Technician, Master Training Specialist, and a Demolition/Burn Operations Supervisor.

REPRESENTATIVE PROJECT EXPERIENCE

UXO Diving Operations, Jackson Park Housing Complex, Bremerton, WA, 6/26-8/11/2000, 8/27-Present - Assigned as Diving Supervisor/Diver to remove ordnance from around and under piers.

USRADS Survey, Dupont's Lake Success Business Park, Bridgeport, CT, 6/6-6/13/2000 - Senior UXO Supervisor conducting USRADS survey of 70 acre tract of proposed business park.

Landfill Removal Operations, Groton, CT, 2/23-6/5/2000 - Assigned as Site Health and Safety Officer for operations to remediate a known landfill where ordnance items had been recovered.

Massachusetts Military Reservation, Falmouth, MA, 12/1999-1/2000 - UXO Supervisor conducting UXO avoidance, clearance of access roads and downhole monitoring for sampling well installation.

Naval Air Facility, Adak, AK, 8/26-11/11/1999 - Site Health and Safety Officer responsible for on-site monitoring, PPE, site surveillance, hazard identification, and health risk analysis. Developed and conducted daily health and safety briefs.

Naval Air Facility, Adak, AK, 4/1-8/25/1999 - UXO Supervisor conducting geophysical surveys of approximately 40,000 acres in rugged mountainous terrain using state of the art geophysical and DGPS positioning instrumentation. Conducted intrusive operations in the same remote locations.

Naval Hospital Bremerton, WA, 2/22-3/8/99 - UXO Supervisor conducting survey operations, downhole sampling, and flash treatment of recovered small arms ammunition.

Environmental Hazards Specialists International, Inc., Fort Wingate, NM, 1/19-2/18/1999 - UXO Technician providing UXO support for surveying and marking grid sections for intrusive operations. PErformed surface and subsurface clearance in mountainous terrain. Demolition team member.

Minefield Investigations, Naval Air Facility, Adak, AK, 8/20/1998-11/16/1998 - UXO Supervisor on an UXO team investigating 12 suspected world war II minefields. These investigations were conducted in remote areas of the island where access using all terrain vehicles was required. There were many additional personnel hazards from concealed screw type pickets, entanglements, and the severe Aleutian weather. These operations were conducted without personnel injury or damage to equipment.

Naval Air Facility, Adak, AK, 6/2 - 7/14/1998 - UXO Technician, investigated and sampled areas suspected of UXO contamination using heavy equipment. Operated backhoe, Frontend Loader, and Excavator during intrusive operations.

Sandy Hook National Park, NJ, 3/8-5/23/1998 - UXO Supervisor, performed investigation and intrusive sampling of areas suspected of UXO/OE contamination. Demolition Team Leader.

PRIOR EXPERIENCE

EOD Mobile Unit ELEVEN, Oak Harbor, WA, 7/1/1994-1/31/1998 - Performed the following duties while assigned to this unit: Readiness and Training Department Manager, Mine Countermeasures Detachment Leading Chief, Qualification and Certification Board Member, and Unit Training Coordinator.

EOD Training and Evaluation Unit ONE, Barbers Point, HI, 3/1/1991-6/30/1994 - Performed the following duties while assigned to this unit: Assistant Training Officer, Nuclear/Chemical Weapons Division Officer, and the Air/Surface Weapons Division Officer.

EOD Mobile Unit THREE, San Diego, CA, 8/26/1987-1/31/1991 - Performed the following duties while assigned to this unit: EOD Detachment North Island Maintenance Chief, EODMU THREE DETACHMENT NINE, USS Mount Vernon, and EODMU THREE DETACHMENT EIGHT ONE, Leading Chief (Marine Mammals).

TRAINING

8-Hour Refresher OSHA HAZWOPER - Yearly Updates
40-Hour OSHA HAZWOPER - March 1998
HAZWOPER Supervisor - January 1999
40-Hour HSO Course - January 1999
DOT and Waste Management Training - January 1999
U.S. Army Corps of Engineers Quality Control Course - February 2000
Medic/First Aid/CPR, April 1999
All Terrain Vehicle Operator - September 1998
Backhoe/Excavator Operator - June 1998
Nuclear Emergency Team Operations - June 1992
Advance Access and Disablement - February 1990
Naval School Explosive Ordnance Disposal - June 1987

DISCIPLINE CODES

109 Construction/Field Personnel, N
199 UXO Technician, Y

TECHNICAL SPECIALTIES

UXO Health and Safety Officer

UXO Quality Control Officer
UXO/Diver

OTHER DATA

Office Location: Bremerton Navy
FWENC Hire Date: 03/02/2000
Years w/Other Firms: 0
Daytime Phone: 360-373-4966

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EXPERIENCE SUMMARY

13 years experience in planning and administering explosive Quality Control Programs and UXO Safety Programs. 8 years direct Quality Control experience

23 years EOD/UXO experience

19 years directly supervising range clearance operations

21 years supervising EOD operations

PROFESSIONAL AFFILIATIONS

REGISTRATIONS/CERTIFICATIONS

ASQ Certified Quality Auditor

TRAINING

EDUCATION

BS, Business Management
MS, Basic US Naval EOD School, Indian Head, MD, 1976

REPRESENTATIVE PROJECT EXPERIENCE

UXB International, Inc.; UXOQC Manager; Master EOD Technician - Manage all activities of QC department of Kaho'olawe Island to include monitoring and directing UXO, Environmental, Natural Resources, and Historical Properties personnel, Ensure all operations and processes are in compliance with accepted standards of quality, regulations and directives. Write reports and recommend corrective action to improve processes. Conduct root cause analysis to determine why a process is out of control. Write plans and procedures. Implement project quality control plan. Develop sampling plans for surface and subsurface clearance.

UXO International, Inc.; UXO Specialist Supervisor; Master EOD Technician - Supervise and manage excavation team. Safely excavate multiple anomalies. Developed procedure and techniques for safely and efficiently processing anomalies. Identified deficiencies and suggest improvements for standard operating procedures and operations. Functioned as team leader for various teams including survey, assessment, data, material management, and area preparation. Developed technique for removing razor wire from Bone Yard using available material and equipment that eliminated handling by hand. Operate geophysical equipment.

Ecomunition, Inc.; UXO Specialist; Master EOD Technician - Responsible for UXO avoidance and escort duties. Escorted groups of scientists through areas contaminated with OE on Amchitca Island, Alaska. Used magnetometers for down-hole monitoring. Assisted in collecting, processing, preparing, packaging, and shipping biological samples. Operated mien detection and ordnance locating equipment. Maintained daily log of activities. Conducted daily safety briefings. Encountered U.S. WWII bombs, projectiles, rockets, grenades, fuses, and small arms.

Foster Wheeler Environmental, Inc.; UXO Specialist; Master EOD Technician - Operated and performed operator maintenance on Caterpillar and Case back hoe and track hoe excavating equipment. Located and excavated buried anomalies using maps, CAD drawings, engineering drawings, GIS data,

metal detectors, and heavy equipment.Operated heavy equipment in the intrusive phase of operations to excavate identified anomalies. Acted as safety observer during various phases of intrusive operations. Ordnance encountered U.S. WWII ordnance.

McDonnell Douglas Services; Senior EOD Advisor - Master EOD Technician charged with instructing and advising Royal Saudi Air Force (RSAF) personnel on all matters relating to aircraft weapon systems, air-to-ground and air-to-air ordnance, including U.S. and foreign ordnance enhancing the capability of the RSAF to support their mission. Counseled and advised Senior RSAF management personnel on all aspects of maintaining an effective and viable EOD program, making suggestions for establishing new programs and improving existing operations resulting in expanded EOD capability. Wrote standard operating procedure and operating instructions covering subjects such as demolition, safety, response procedures, training, range clearance, operations, and others. Trained RSAF personnel on individual weapon systems acquired through various programs resulting in 100% mission capability prior to weapon systems being deployed in country. Managed and supervised multiple RSAF EOD teams in range clearance operations in remote locations including search, detection, access, identification, and disposal on conventional U.S. and foreign air and ground ordnance. Developed lesson plans and conducted upgrade training for RSAF EOD personnel resulting in upgrade to the next skill level increasing overall proficiency and confidence of EOD Technicians. Planned, coordinated, conducted, and supervised complex multinational range decontamination operations, both surface and subsurface, ensuring areas are free of unexploded ordnance, munitions residue, and scrap, using ordnance locators, mine detectors, and heavy equipment without incident or accident. Selected appropriate courses of action in performance of range clearance and demolition operations. Collected data and conducted research to identify ordnance found in ranges and within our area of responsibility using 60-series and U.K. technical data. Supervised demolition operations. Acted as range safety officer during range clearance and demolition operations. Conducted quality assurance inspections and surveys to ensure work was being performed within parameters of the contract and in compliance with RSAF directives and regulations. Supervised 9 EOD personnel and 15 non-EOD personnel. Ordnance encountered U.S. and foreign bombs, rockets, missiles, submunitions, projectiles, mortars, grenades, mines, flares, CAD/PAD items, small arms and cannon ammunition.

NCOIC EOD Flight, 15 CES/EOD, Hickam AFB, HI - Master EOD Technician directly supervising complex multiple EOD teams in the execution of complex UXO range clearance operations including search, detection, access, identification an disposal of conventional air and ground ordnance. Coordinated, planned, executed, and supervised day-to-day activities of EOD until having the largest area of responsibility in the Air Force while maintaining a high level or readiness. Wrote operating instructions covering subjects such as, range clearances, unique operations, safety, and day-to-day activities. Participated in and provided personnel for range decontamination operations on Kaho'olawe Island and throughout the Pacific. Supervised and conducted sub-surface clearance of specific areas on Wake Island in preparation for launch pad construction. Senior EOD member of Joint Task Force - Full Accounting (JTF-FA) investigation team charged with keeping team members safe while operating in ordnance contaminated areas of Vietnam, Cambodia, and Laos. Performed demining in support of JTF-FA recovery missions in Vietnam, Senior EOD member of Pacific Air Command Inspectors General (IG) Team responsible for evaluating and rating the performance and capability of other EOD units during IG inspections. Member of Wing Exercise Evaluation Team responsible for developing scenarios, setting-up exercises, and evaluating responses to base level exercises simulating airfield attacks, major accidents, and terrorist activity, all involving ordnance. Conducted quality control visits to other EOD units as part of the PACAF Technical Inspection Program. Range Safety Officer responsible for safety during range/explosive operations on the EOD demolition range. Supervised 15 EOD personnel. Ordnance encountered bombs, missiles, rockets, grenades, mines, submunitions, mortars, flares, small arms and cannon ammunition.

NCOIC EOD Operations, 343 CES/EOD, Eilson AFB, AK- Planned, scheduled, coordinated, supervised, and participated in the clearance of Blair Lakes, Yukon, Oklahoma, and Delta Creek range complexes. Master EOD Technician directly supervising multi-team UXO range clearance operations with teams performing different tasks simultaneously such as, locating ordnance, identifying ordnance, excavation, demolition, etc. EOD representative to the Wing Exercise Evaluation Team, responsible for conducting UXO/ordnance related exercises. Quality Control NCO for the EOD Flight ensuring all flight operations was completed in accordance with acceptable standards, regulations and directives. Administered Flight Quality Control program IAW Air Force, Command, and Squadron directives and instructions. Primary custodian for EOD explosives supply accounts. Supervised 9 EOD personnel. Ordnance encountered bombs, missiles, rockets, grenades, mines, submunitions, mortars, flares, CAD/PAD items, small arms and cannon ammunition.

NCOIC EOD Training, 4450 Tactical Group/EOD, Nellis AFB, NV- Planned, scheduled, coordinated, and directed EOD personnel training and staff development programs. Master EOD Technician supervising large0scale range clearance operations employing multiple EOD teams executing search, detection, access identification and disposal. Sited and established new demolition/proficiency range IAW applicable regulations. Developed procedures and wrote draft technical orders for new aircraft and weapons systems. Supervised 5 EOD personnel. Ordnance encountered classified research ordnance, bombs, missiles, rockets, projectiles, grenades, submunitions, flares, CAD/PAD items, small arms and cannon ammunition.

Awarded Master EOD Technician Badge

EOD Technician/Equipment & Supply NCO, 2701 EOD Squadron, Hill AFB, UT- EOD Technician supervising range clearances, tests, and large-scale disposals conducted the Utah Test and Training Range including search, detection, access, identification, recovery, and disposal of conventional air and ground ordnance. Supervised surface and sub-surface clearance of land areas being returned to civilian authorities. Supervise clearance of random delay submunitions target areas. Supervised demolition operations. Assigned as Quality Control NCO ensuring teams followed all procedures and safety precautions during nuclear weapon certifications. Supervised 4 EOD personnel. Encountered bombs, missiles, rockets, grenades, mortars, submunitions, flares, bulk explosives, CAD/PAD items, small arms and cannon ammunition.

Awarded Senior EOD Technician Badge

EOD Technician/Technical Data Librarian, 400 MMS/EOD, Kadena AB, Okinawa - Participated in range clearances and clean-up operations. Escorted non-EOD personnel into hazardous areas. Collected field data on munitions item and researched technician orders resulting in positive identification of munitions. Conducted sub-surface clearance of munition dud area using mine detecting equipment and robes. Conducted munition disposal operations. Maintained explosive supply point account for operations, emergency response, and training explosives. EOD technician assigned to the Field Radiological Survey Team, Enewetak Atoll, responsible for all EOD related matters involving northern islands. Supervised explosive operations and deposal of WWII ordnance found on Enewetak Atoll. Supervised radiological surveys of specific areas of Enewetak. Encountered extensive WWII U.S. and Japanese ordnance, bombs, missiles, rockets, grenades, mines, projectiles, submunitions, flares, and small arms and cannon ammunition.

3207 MMS/EOD, Eglin AFB, FL; EOD Specialist- Participated in and supported munitions tests

involving new weapons systems. Participated in clearance of random delay submunitions target areas. Participated in large munitions disposal operations. Collected field data and information from ordnance found in the field in order to make a positive identification of ordnance items. Maintained munitions supply point account for demolition explosives and training munitions items. Encountered: bombs, missiles, rockets, sub-munitions, flares, CAD/PAD items, small arms and cannon ammunition.

PRIOR EXPERIENCE

PUBLICATIONS

PROFESSIONAL REFERENCES

PROFESSIONAL ACCOMPLISHMENTS

DISCIPLINE CODES

199 UXO Specialist, Y

TECHNICAL SPECIALTIES

SKILL SET

LANGUAGE SKILLS

OTHER DATA

Office Location: HOME
FWENC Hire Date: 06/18/1998
Years w/Other Firms: 2
Daytime Phone: 270-343-6933

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EXPERIENCE SUMMARY

Mr. Rubino's immediate responsibilities at Foster Wheeler will include an assessment of current GIS requirements for the UXO program, a review of existing site GIS software, providing recommendations where deficiencies may exist or where requirements mandate; providing guidance in the establishment of data dictionaries and procedures to support the GIS segment of the UXO program; and finally the implementation and exploitation of GIS data to assist in supporting the control, site safety, project documentation, and presentation of UXO remediation work. Additionally, he will be responsible in designing the GIS system so that data collected can be used to assist project leads for planning purposes, having more clear and accessible data from which to make estimates and proposals for future remediation projects. Long term, Mr. Rubino will work to apply GIS technology for implementation in other areas outside of the UXO field.

TRAINING

Intergraph MGESX (MGE base) - 1993
Intergraph MGFN (Map Finisher) - 1994
Intergraph Image Station (Image Data Cap / Image Analysis) - 1994
Intergraph Geo-Media Professional - 2000

EDUCATION

BS, Environmental Rsc. Mgmt. & Planning, University of West Florida, 1988

REPRESENTATIVE PROJECT EXPERIENCE

US Corps of Engineers; UXO Fort McClellan, Ft. McClellan, Anniston, AL; GIS Specialist; Load and evaluate GIS products at Fort McClellan - Provide near term products and planning graphics to site managers and planners. Created thematic and spatial representation of data captured at Fort McClellan after aligning local databases for project reports. Responsible to establishing conventions for data import into the GIS environment, procedures for database maintenance, and methodologies and procedures for exploitation and presentation of data.

PRIOR EXPERIENCE

National Imagery and Mapping Agency (Intergraph Services Company); Hardcopy Map Production - Omnibus, Huntsville, AL / Bangkok, Thailand / Jackson, MS / New Orleans, LA; Huntsville, AL; Hardcopy Production Technical Lead; 02/98-10/00 - Mr. Rubino served as the Map Finishing/Publishing Technical Lead, engineering, implementing and streamlining workflows in the production of TLM 50,000, 100,000 sheets, Combat Charts, Nautical Charts, and JOG (A) sheets. His tasks included developing and documenting procedures to enhance workflow, create and implement parameter files and initialization data to support production, design applications and providing guidance to developers in the creation of production enhancement tools. Additionally, Mr. Rubino took part in project planning, system management, configuration management, and ISC marketing efforts.

Formerly Mr. Rubino acted as a Systems Consultant in the Special Projects area. In support of the Digital Production (Demonstration) program for the National Imagery and Mapping Agency (NIMA), Mr. Rubino used a Windows NT-based DCAFE Map Publisher workflow to produce 1:50,000 Topographic Line Maps (TLMs) in both TIFF Group IV (direct to plate) and film separate formats. During this project, refined workflow, testing software, and formalizing quality assurance procedures. Mr. Rubino also assumed primary responsibility for Vector Product Format (VPF) production of

VMAP Level 2 data for DP (D). Mr. Rubino has also been responsible for performing revisions of discrepancies for both TLMs and VMAP2 on DP (D). In addition, Mr. Rubino has been performing VPF product finishing for the Digital Nautical Chart (DNC) program. In performing VPF product finishing, Mr. Rubino is responsible for executing VPF Validator software and resolving any discrepancies detected and using the VPF Viewer to perform visual quality assurance inspections. While performing VPF product finishing, Mr. Rubino has implemented tools to automate the production workflow and ensure consistency in performing data archiving.

Mr. Rubino has taken a marketing responsibility in the development of web pages for ISC, as well as staffing at the 1998 Intergraph Users' Group ISC booth area. He has also provided assistance in the evaluation of customer requirements and the development of proposals.

- National Imagery and Mapping Agency
- NIMA College, Ft. Belvoir, VA
- Mapping and Charting Establishment, Ottawa Canada
- Hungarian Military, Budapest, Hungary
- French Military, Paris, France
- Spanish Military, Madrid, Spain
- AmilGeo, Bonn, Germany
- Korean Army Map Service, Taejan, Korea
- Topo Dienst, Emmen, Netherlands

Intergraph Corporation; Hardcopy and Digital Mapping projects under NIMA/VPF Implementations, International; Huntsville, AL; Systems Engineer; 08/92-02/98 - Mr. Rubino performed system and software integration of Intergraph UNIX- and Windows NT-based commercial and custom software and developed VPF and Hardcopy Map Production workflow for domestic and international customer sites. He also was an integral in the development of workflow documentation and training manuals, and he conducted domestic and international training classes on both civilian and military sites. Mr. Rubino performed customer software and system support, provided technical consultation, and product demonstrations in support of contract acquisition efforts, conducted site evaluations, and performed configuration management.

Mr. Rubino performed workflow design and implementation on the production of various hardcopy cartographic products using Intergraph Modular GIS Environment (MGE) products in populating and extracting map feature information exploiting relational databases. He developed, documented, and trained MPE workflow, integrating the data captured for VPF production using MGE Map Finisher and MGE Map Publishing environments. He also integrated custom and commercial software packages into the digital Vector Smart Map (VPF) production workflow and developed training and user guides.

One of Mr. Rubino's major tasks serving as the technical lead on the NIMA Vector Product Demonstration (VPD) program for the design and implementation of a VPF symbology prototype using CGM file formats and database structures. This symbology effort was to supply symbolization to VPF viewing software for twelve VPF products. Mr. Rubino was responsible establishing symbology rules and procedures and a comprehensive symbol library built in accordance with military standards and International Hydrographic Office (IHO) specifications of color, style, and ambient light observance. Additionally, Mr. Rubino created table structures and documentation, and he tested the product on SUN, Macintosh, Windows95, and Windows NT platforms. Mr. Rubino also identified issues in the NITFS CGM standard and was key in taking part in multi-agency discussions that resulted in revisions to the standard

Lastly, Mr. Rubino designed and wrote UNIX shell scripts for streamlining various workflow processes and system management functions and took configuration management, customer software delivery, and system management responsibilities for his organization.

Rand McNally; 1993 Road Atlas, Chicago, IL; Systems Engineer; 08/91-08/92 - Mr. Rubino provided technical assistance to development staff in the design and development of project workflow during the 1993 Road Atlas Project. He managed a network of Intergraph UNIX workstations; conducted network expansion planning; examined and facilitated operation protocol; evaluated, installed, and maintained on site and third-party software and hardware; and performed system baseline and software deliveries. Mr. Rubino also provided upgrade orientation to production and development personnel and provided assistance in the production areas whenever necessary.

Defense Mapping Agency; Washington, D.C.; Cartographer; 01/89-08/91

Cartographer, Mapping and Charting Department; 12/90-08/91 - Mr. Rubino acted as MPE technical lead responsible for supervising production of six cartographers, performing quality assurance reviews, and performing system manager duties. Mr. Rubino streamlined image Map production workflow by writing UNIX shell programs and creating product templates, cell and font libraries; developed training manuals and trained new users.

Temporary Additional Duty: Intergraph, Huntsville, AL; 08/90-12/90 - Mr. Rubino was selected to participate and work on site in the development, verification and factory acceptance testing of MPE hardware, software and developed standard production operating procedures for DMA. Areas of focus included Map Publishing, InterPlot, IVEC and, system management and shell authoring. While performing this assignment, Mr. Rubino participated in the production of image maps for the Desert Shield operation.

Digital Products Department; 01/89-08/90 - Mr. Rubino operated on PASS II analytical stereoplotter and UNIMACE automated profiling system in the collection of DTED, performed photo analysis on Intergraph InterMap analytical stereoplotter, assumed system manager duties, performed post process manuscript compilation, conducted quality control, and provided training to other personnel.

PROFESSIONAL REFERENCES

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DOD TS Clearance (Not current)
Desert Storm Support Award
NIMA Beneficial Suggestion Awards (2) - Cash awards for processes enhancements: NIMA St. Louis/DC 1992

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OTHER DATA

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STANDARD OPERATING PROCEDURE
ORDNANCE AND EXPLOSIVES DEMOLITION

US ARMY CORPS OF ENGINEERS
AND
FOSTER WHEELER ENVIRONMENTAL CORPORATION

CONTRACT NUMBER DACA87-99-D-0010

FORT McCLELLAN
FORT McCLELLAN, ALABAMA

REVISION 4

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3-1 Explosive Demolition Activities Checklist
4-1 Explosive Demolition Log
5-1 OE Acquisition and Accountability Log
6-1 Demolition Operations, Remote Firing Device (RFD)
7-1 Demolition Operations, Scorpion Blasting Machine

ACRONYMS AND ABBREVIATIONS

BIP	Blow in Place
CCC	Counter Charge the Cone
CCBC	Counter Charge Bottom Center
CCMC	Counter Charge the Main Charge
CFR	Code of Federal Regulation
CQC	Contractor Quality Control
EOD	Explosive Ordnance Disposal
HS	Health and safety
ID	Identification
NORS	Non-Ordnance Related Scrap
OE	Ordnance and explosives
OES	Ordnance and Explosive Scrap
PPE	Personal protective equipment
QC	Quality control
SCBA	Self-contained breathing apparatus
SSHO	Site Safety and Health Officer
SSHP	Site-Safety and Health Plan
SOP	Standard Operating Procedure
USFWS	U.S. Fish and Wildlife Service
UXO	Unexploded ordnance
WP	White Phosphorous

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1.0 PURPOSE

This document provides basic demolition procedures that are applicable to all explosive main charge fillers, explosive initiating components and OE operations. This procedure does not include nuclear, chemical or biological munitions.

2.0 SCOPE

This document contains guidance for OE demolition procedures applicable for disposal of explosive ordnance, but is limited to procedures that are basic or general in nature. The following assumptions are considered:

- These procedures are intended for personnel qualified to be involved in OE demolition operations.
- UXO personnel do not perform rendering safe procedures except when specifically authorized in writing for a specific task.
- Ordnance items that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard will be considered armed.
- OE items that are fuzed will not be moved.

3.0 MAINTENANCE

The Foster Wheeler, Fort McClellan Project Manager is responsible for updating this procedure.

4.0 DEFINITIONS, ACRONYMS, AND ABBREVIATIONS

- ***Exclusion Zone*** - Areas where contamination (hazards) is known or likely to be present, or because of activity, have the potential to cause harm to personnel. The exclusion zone shall be large enough to protect other personnel from the blast and fragmentation hazards of accidental detonation. The exclusion zone for OE operations will be in accordance with DOD 6055.9 STD or calculated by the USAESCH Engineering Branch.
- ***Expended Ordnance***- Ordnance that has functioned as designed, leaving the shell or container behind. This shell of the container may or may not contain explosive/pyrotechnic/toxic residue. This material would not be considered inert, and could not be salvaged as scrap without appropriate visual inspection, sampling, and/or treatment.

- ***Explosive Ordnance Disposal Personnel*** - Active duty military personnel who have completed the training course at the U.S. Naval School, Explosive Ordnance Disposal (EOD), Indian Head, Maryland or Eglin AFB, Florida, US Army bomb Disposal School, Aberdeen Proving Ground, Maryland, and are currently assigned to a military EOD unit.
- ***Foster Wheeler Environmental Command Center*** - A designated location staffed by personnel to relay and control all communications/activities of field personnel and other units.
- ***Inert Ordnance*** - Ordnance that never contained explosives, or ordnance that have had all explosive components removed and certified safe.
- ***Intrusive Investigation*** - Excavating for suspected OE items or for plotted anomalies. Excavation will be by hand, or utilizing mechanical equipment as deemed appropriate.
- ***Non-Intrusive Investigation*** - Locating/investigating OE on the surface of the ground where excavation is not required.
- ***Non-Ordnance Related Scrap and Non-Explosive Metal Debris*** – Metal debris recovered during operations, which is not ordnance related, such as metal rebar, angle iron, sheet metal and bar stock, etc.
- ***Open Detonation (OD)*** - A method of demolition for explosive ordnance where a donor explosive charge is detonated in contact with the ordnance to achieve a high order detonation of the energetic materials contained within the ordnance
- ***Ordnance and Explosives*** - Bombs, guided and ballistic missiles, artillery, mortars, rocket ammunition, small arms ammunition, antipersonnel and antitank mines, demolition charges, pyrotechnics, grenades, sea mines, torpedoes, depth charges, containerized and non-containerized high explosives and propellants, depleted uranium rounds, military chemical agents, and all similar components related to munitions that were designed to cause damage to personnel or material through explosive force, incendiary action, or toxic effects. Non-containerized high explosives, propellants, or soils contaminated with explosive constituents are considered explosives if the concentration of explosive material is 10 percent or higher.
- ***Ordnance and Explosive Metal Debris*** - Ordnance materials which have not been in direct contact with the energetic materials of the ordnance, such as bomb fins, grenade spoons, shipping containers, etc.
- ***Ordnance and Explosive Scrap*** - Ordnance materials which have been in direct contact with the energetic materials of the ordnance, such as, expended rocket motors, shell casings, warhead fragments, powder containers, etc.
- ***Practice Ordnance*** - Munitions that demonstrate similar characteristics as their high explosive counterparts, and may or may not contain pyrotechnic, explosive, or chemical (e.g., titanium tetrachloride) spotting charges.

- ***Unexploded Ordnance*** - Military munitions that have been primed, fuzed, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installation, personnel, or material, and remain unexploded either by malfunction, design, or any other cause. For the purpose of this project, the definition of UXO is limited to items larger than .50-caliber.
- ***UXO Personnel*** – Personnel qualified in accordance with Data Item Description OE-025 (3 March 2000) and are currently working as a civilian specialist with OE items/materials.

5.0 DISCUSSION

Coordination of all personnel assigned to a project will be vital to the safe and efficient disposal process. Assistance of all contractors and activity personnel is encouraged to ensure that the demolition operations will be completed in the safest possible manner.

Coordination activities will begin with a series of meetings with the client to identify shared and individual responsibilities of each organization. The community will be informed of the project schedule and the expected impacts through a public meeting presentation. The coordination, notification, and verification activities are outlined below.

Coordination Meeting - Before explosive demolition operations are scheduled to begin, a coordination meeting will be conducted to establish roles and responsibilities. The meeting will address specific elements of planning and responsibilities. Topics will include:

- Explosive handling and transportation;
- Required support services, fire, medical, security, etc.;
- Notifications;
- Maintenance of exclusion zone; and
- Community impact.

Public Meeting - A public meeting will be held, if required, prior to commencing activities. A Foster Wheeler Environmental representative will present a brief detailing the sequential steps involved with the scheduled activities. Topics will include:

- Daily hours of operation;
- Requirements for evacuation and road closures;
- Exclusion zone procedures; and
- Emergency procedures.

Notifications - The Foster Wheeler Environmental command center will notify Transition Force Operations on Thursday of each week of the following weeks schedule.

This will ensure the timely coordination arrangements for the evacuation of designated areas and closure of required roads during demolition. For OE Demolition support outside of FWENC assigned areas, tasking will come from the USAESCH Safety Representative. Foster Wheeler Environmental will ensure that the following agencies are informed of the schedule and prepared to respond as necessary for emergency assistance:

- Medical Facility; Springfellow Memorial Hospital – 256-235-8900
- Fire Department - (emergency); - 911
- Police Department – (emergency) - 911
- Fire Department - (non-emergency) – 256-231-7644
- Police Department – (non-emergency) – 256-238-1800
- Ft McClellan Transition Force Operations – 256-848-5178

Exclusion Zone Information - Foster Wheeler Environmental will provide the client one copy of the required exclusion zone if the detonation is to be conducted on-site. Maps with EZ arcs based on the fragmentation range for the most probable munition to be encountered for each grid/sector will be provided. Transition Force (TF) Operations will coordinate evacuations and road closures with all personnel in the affected areas. Foster Wheeler Environmental will erect exclusion zones and be responsible for road closures during demolition activities. Special access to the exclusion zone will be coordinated through Foster Wheeler Environmental on-site personnel. Field logbook entries will be used for personnel accountability. Exclusion zones will remain in effect until notifications have been made by the Foster Wheeler Environmental command center.

Daily Verification - Prior to each day's activities, the Foster Wheeler Environmental command center will verify daily that the following have been performed:

- Emergency response activities have been notified and are available
- Exclusion zones have been evacuated as required.

5.1 PERSONNEL REQUIREMENTS

All personnel assignments, qualifications and positions will be in accordance with USAESCH DID OE-025 of 3 March 2000.

Senior UXO Supervisor (SUXOS) is responsible for planning, directing and executing all explosive demolition operations and ensuring the safety of all personnel.

Prior to the initiation of demolition operations, the SUXOS shall designate an experienced and trained UXO Technician III to act as the Demolition Supervisor (DS). The DS will be directly in charge of all demolition activities. The DS will have the responsibility of supervising all demolition operations within the area and will be

responsible for training all on site UXO personnel regarding the nature of the materials handled, the hazards involved and the precautions associated with the items being handled and disposed of. The DS will also ensure that the daily demolition log, ordnance accountability log, shot records and inventory of material consumed with each operation are accounted for. The DS will be present during all demolition operations and will ensure that the exclusion zone is clear of all unauthorized personnel before commencing explosive handling operations. A minimum of two UXO Technicians will assist the DS in conducting explosive demolition operations in addition to road guards and other tasks as assigned.

The UXO Safety Officer (UXOSO) will ensure that all work within the exclusion zone is performed in accordance with the approved *Site-Specific Work Plan and this SOP for Demolition Operations.*

The UXO Quality Control Specialist (UXOQC) for the site is responsible for ensuring that demolition operations are conducted in accordance with this procedure and the site-specific work plan. The QCS and demolition team personnel will inspect each demolition pit with a magnetometer to ensure that each pit is free of metallic objects. The team will also visually inspect the area surrounding the pit to ensure that the area is free of kick outs or other hazardous material.

5.2 TRAINING REQUIREMENTS

All personnel assigned to the Demolition Team and other site personnel involved with the disposal process will attend a site-specific orientation. The purpose of this orientation will be to review site-specific and emergency response procedures. The topics to be covered during the orientation are listed below. Course attendance sheets with attached curriculums will be used to document completion of each orientation session.

TRAINING SCHEDULE

A. Introduction

   1. Project summary

B. Presentation

   1. *Site-Specific Health and Safety Plan* (SHSP) review

   2. Review SOP

   3. Equipment training

      a. Remote Controlled Firing Device

      b. Scorpion Firing Device

   c. Selected donor explosives

4. Emergency procedures

   a. Review emergency response equipment

   b. Talk/walk through of emergency procedures

   c. Emergency drill

5.3 EQUIPMENT/MATERIAL REQUIREMENTS

Each DS will inspect health and safety and demolition equipment prior to commencing operations. A demolition equipment checklist is included as Attachment 1. A checklist of health and safety equipment is included as Attachment 2. It is anticipated that all tasks will be performed in Level D personal protective equipment (PPE).

The following publications are required to be on the Fort McClellan site during demolition operations:

- Approved Work Plans
- DOD 6055.9 STD
- TM 60A-1-1-4, Protection of Personnel and Property
- TM 60A-1-1-31, General Information on EOD Disposal Procedures; and
- EM 385-1-1, Safety and Health Requirements Manual
- State and local directives
- USAESCH DID OE-025
- ATFP- 5400.7 Explosive Laws and Regulations
- Foster Wheeler Environmental Demolition Procedures
- Foster Wheeler Environmental UXO Safety (SWWP, Attachment 6-10)

5.4 OE EXPLOSIVE ORDNANCE OPERATIONS

This section provides guidance for the safe demolition of recovered OE/UXO.

5.4.1 General Safety Precautions

The following precautions/procedures apply to all OE Demolition Operations conducted by Foster Wheeler Environmental Corporation. Demolition operations will be in accordance with all local, state and federal regulations pertaining to use, transporting, storage and demolition of explosive materials. All plans for demolition of explosives will be reviewed by Foster Wheeler Environmental Corporation to ensure compliance with federal, state, and local regulations pertaining to use, transporting, storage, and demolition of explosive materials. All exclusion zones for OE operations will be in

accordance with DOD 6055.9 STD or as calculated by the USAESCH Engineering Branch. If specific computed distances are not available for the munitions being disposed of the following general distances will apply;

- For explosive materials, evacuation will be in accordance with Table C5.T1 and C5.T2 of DOD 6055.9 STD with changes dated 5 July 2000 or the calculation sheet for the specific ordnance as provided by USAESCH for Ft McClellan.
- Items with lugs, strong backs, tail plate sections, etc., should be oriented away from personnel locations as fragmentation from these items tends to travel farther than normal. Consideration should be given to tamping the OE to control fragments, if the situation warrants. Fragments shall be minimized not only to protect personnel but also property, such as buildings, trees, etc.
- Open burning of explosives and smokeless powder or chemical decomposition of explosives shall not be accomplished. Do not inhale the smoke or fumes of burning pyrotechnic or incendiary materials that may catch fire. The fumes and dust from many of these materials are irritating and/or toxic if inhaled.
- Do not use water on incendiary fires. Water may induce a violent reaction or be completely ineffective, depending on the mixture.
- Inert ordnance will not be disposed of or sold for scrap until the internal fillers have been exposed and unconfined. Heat generated during a reclamation operation can cause the inert filler, moisture, or air to expand and burst the sealed casings. Venting or exposure may be accomplished in any way necessary to preclude rupture due to pressure from being confined.
- If the situation dictates, protective measures to reduce shock, blast, and fragmentation shall be taken. Army Technical Manual TM 5-855-1, Fundamentals of Protective Design for Conventional Weapons, DOD 6055.9 STD and TM 60A-1-1-4, Protection of Personnel and Property, contain data on blast effects, ground shock, cratering, ejection, and fragmentation.
- Maintain minimum safe distances between electromagnetic-radiating sources and electro-explosive devices. Do not conduct blasting or demolition operations during an electrical, dust, sand, or snowstorm of a severity great enough to produce atmospheric static electrical charges, or when such a storm is nearby (approximately 5 miles). Under such conditions, all operations will be suspended, cap and lead wires short-circuited, and personnel removed from the demolition area.
- The two-man rule will be in effect in all demolition operations. In addition, a third person (UXO Safety Officer) shall be available near the demolition site to act as a safety observer and communications watch in the event of an accident.
- Loose initiating explosives include lead azide, mercury fulminate, lead styphnate, and tetracene. These explosives manifest extreme sensitivity to friction, heat, and impact. Extra precautions may be required when handling these types of

explosives.

- Keep initiating explosives in a water-wet condition at all times until ready for final preparation for detonation. The sensitivity of these explosives is greatly increased when dry.
- Only condition code "A" or "C" military explosive items, or commercial explosives within their shelf life limit, shall be used as donor explosives for demolition operations. Exercise extreme care in handling and preparing high explosives for detonation. They are subject to detonation by heat, shock, or friction.
- Do not pack bomb fuze wells with explosives unless it can be positively confirmed that the fuze well does not contain any fuze components.
- Photo flash bombs must be handled with the same care as black powder filled munitions.
- UXO containing white phosphorous shall not be detonated into the ground. White phosphorous munitions shall be counter-charged on the bottom centerline (CCBC) when possible.
- Carry blasting caps in approved containers and keep them out of the direct rays of the sun, and located at least 25 feet from other explosives, until they are needed for priming. Do not work with electric blasting caps or other electro-explosive devices while wearing static-electricity producing clothing (nylon, silk, synthetic hair, etc.).
- Do not use explosives or accessory equipment that are obviously deteriorated or damaged. They may cause a premature detonation or fail completely.
- Always point the explosive end of blasting caps, detonators, and explosive devices away from the body during handling.
- Use only standard blasting caps of at least the equivalent of a commercial No. 8 blasting cap. Use electric blasting caps of the same manufacturer for each demolition shot involving more than one cap. Do not bury blasting caps. Use detonating cord to transmit the shock wave from the blasting caps on the surface to a buried/tamped explosive charge. Buried blasting caps are subject to unobserved pressures and movement, which could lead to premature firing or misfires.
- Test electric-blasting caps for continuity at least 50 feet downwind from any other explosives prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wires together. The wires will remain shunted until ready to be connected to the firing circuit.
- In the event of a misfire, do not approach the demolition site for at least thirty minutes after the expected detonation time when firing electrically. When conducting non-electric procedures, the wait time shall be one hour from the

expected time of detonation.

- A post-detonation search of the demolition site shall be conducted to assure complete disposal was accomplished.
- Do not abandon any explosives. Do not leave explosives, empty cartridges, boxes, liners, or other materials used in the packing of explosives lying around where children or unauthorized persons or livestock can get at them.
- Do not allow any wood, paper, or other materials used in packing explosives to be burned in a stove, fireplace, or other confined space, or to be used for any purpose. Burning at an isolated location outside will destroy such materials. No person should be allowed within 100 feet of the burning operation.
- Do not fight fires involving explosive material. Remove all personnel to a safe location and secure the area.

5.4.2 Transporting, Storing, and Handling Demolition Materials

- Know and observe federal, state, and local laws and regulations, which apply to the transportation, storage, and use of explosives.
- Do not permit metal, except approved metal truck bodies, to contact explosive containers. Do not transport metal, flammable, or corrosive substances with explosives.
- Do not allow smoking, or the presence of unauthorized personnel, in vehicles transporting explosives.
- Carefully load and unload explosives from vehicles. Never throw or drop explosives from the vehicle.
- Assure the load is blocked and prevented from movement and displacement.
- Do not drive vehicles containing explosives over public highways until all permits and certifications have been obtained from the state enforcement agencies. Shipment of explosive materials over public highways will be by licensed commercial carriers unless Foster Wheeler UXO personnel have been specifically licensed and certified to make the shipment.
- Never leave an explosive loaded vehicle unattended.
- Initiating explosives, such as blasting caps, will remain separated at all times. Blasting caps or detonators may be transported in the same vehicle as long as they are packed in a MK 663 MOD 0 container or equivalent container (DA PAM 385-64 Ammunition and Explosives Safety Standards) and secured away from other items.
- Do not store blasting caps, detonators, or other items containing initiating explosives in the same box, container, or magazine with other explosives.
- Store explosives materials in Military or Federal ATF approved magazines.

Ensure that magazines used for the storage of explosive materials comply, with quantity distance requirements, for the class of explosive material they contain. Reference documents include DOD 6055.9 STD and ATF-Explosives Law and Regulation, ATF P 5400.7

- Do not store spark-producing metal/tools in an explosive magazine.
- Do not allow leaves, grass, brush or debris to accumulate within 50 feet of an explosive magazine.
- Do not permit the discharge of firearms within the vicinity of an explosive magazine.
- Do not use any alkaline material such as lye, washing soda, or soap to remove TNT exudate. Alkaline materials will react with the TNT to render it more sensitive.
- Do not permit smoking, matches, or other sources of fire or flame within 50 feet of an area in which explosives are being handled.
- Do not expose explosives or devices containing explosive to prolonged exposure to direct sun light. Such exposure increases sensitivity and deterioration.
- Ensure that all unused explosives are returned to their proper containers and the container closed after use.
- Do not carry explosives or explosive components in pockets or on the body.
- Do not insert anything but time fuse or detonating cord into the open end of a blasting cap.
- Do not strike, tamper with, or attempt to remove or investigate the contents of, a blasting cap (electric or non-electric), detonator, or other explosive initiating device. A detonation will most likely occur.
- Do not pull on the electrical lead wires of electric blasting caps, detonators, or their electro-explosive devices. A detonation is likely to occur.
- Do not attempt to remove an unfired or misfired primer or blasting cap from a base coupling. There is a high risk of an explosion.
- Do not allow unauthorized or unnecessary personnel to be present when explosives are being handled.
- Always point the explosive end of blasting caps, detonators, and other explosive devices away from the body.
- Do not use pull rings or safety pins to lift or handle explosive devices.

5.4.3 OE Demolition Procedures

Thinking safety and working safely must become a firmly established habit when working with or in the vicinity of items, which are potentially dangerous by reason of their

explosive, flammable or toxic characteristics. All personnel engaged either directly or indirectly in operations in which ammunition, explosives, and hazardous materials are involved shall be thoroughly trained in explosive safety. They shall be capable of recognizing hazardous situations and of taking prompt and effective corrective action.

Open Detonation (OD) Procedures will be used. This method uses a properly placed donor explosive charge and when detonated results in a sympathetic detonation of the energetic material. Demolition operations will not be conducted until the ordnance item and its characteristics are positively identified. General guidance on donor charge placement for the specific ordnance type encountered is contained in TM 60A-1-1-31.

If ordnance is discovered which contains white phosphorous (WP), and conditions permit, it shall be countercharged on the bottom centerline (CCBC) to disperse the WP in the air and complete combustion. Care must be taken when returning to the demolition site after detonation to ensure that all WP was consumed. Do not approach the area until all smoke has cleared and the Senior UXO Supervisor has declared the area safe.

Protective equipment including face shield, leather gloves and flame retardant apron such as the type worn by welders will be available and worn when handling suspect WP ordnance. Water and sand will be readily available when handling suspect WP ordnance.

5.5 DEMOLITION OPERATIONS

The safest procedure for personnel when encountering OE is to Blow the item(s) in Place (BIP). The normal time for demolition operations involving ongoing OE clearance operations will be daily between 1300 and 1530 hours. Ordnance items located outside the OE clearance operations by other contractors, military or civilian personnel will be disposed of in a timely manner when all safety considerations, notifications and approvals are received by the SUXOS. All located OE will be disposed of in the position/location found. In the event an area cannot withstand a high order detonation, items that can be safely moved, will be disposed of in an area that can withstand a high order detonation. The following guidelines apply:

(1) If an item is located that is unsafe to move and the area can withstand a high order detonation, then the item will be blown in place.

(2) If an item is located that is unsafe to move and the area can withstand a high order detonation only when engineering controls are used, then the item will be blown in place.

(3) In areas where engineering controls must be used, FWENC will determine if the item can be moved safely and then request approval from USAESCH.

(4) EOD support will be requested by USAESCH only for CWM, for UXO that cannot be identified, or in the event a render safe procedure is required.

5.5.1 Exclusion Zone

An exclusion zone will be established for the ordnance to be blown in place in accordance with DOD 6055.9 STD or as calculated by the USAESCH. Foster Wheeler Environmental personnel will perform closure and evacuation of exclusion zones after coordination with the USAESCH Site Safety Representative.

5.5.2 Engineering Controls

Engineering controls or protective works are measures to reduce the probable effects of the OE creating the hazard in the event of a detonation. These engineering controls will be employed where required to minimize the damage from blow in place operations. These controls may consist of earthen works, sandbags, trenching, buttressing, taping of glass, mounding, flooding, and venting to reduce the effects of detonations. All leaves and dry grass will be removed within a radius of 5 feet of the item.

5.5.3 Posting of Prescribed Procedures

Prescribed procedures specific to the disposal of OE by detonation, emergency procedures, and communications protocol will be posted on site.

5.5.4 Communications

Communications equipment consisting of cellular phone and a hand held transceiver would be available for emergency communications with fire and medical support activities. Radio and cellular phone transmissions will be secured whenever electric blasting caps are exposed.

5.5.5 Safety Signals

The SUXOS will also communicate a five-minute warning to TFO Base, and a one-minute warning and the fire command on the hand held radio to all project personnel

5.5.6 Demolition Team Vehicles

There shall be a sufficient number of vehicles, equipped with seat belts for each member of the Demolition Team. The vehicles will be parked in a protected area free of vegetation, facing away from the detonation site with the keys left in the ignition. The vehicles designated to transport explosives shall not be used to transport passengers when explosives are on board and must comply with the provisions of 49 CFR 177.835 (e) and (f). Smoking, or flames producing devices are not permitted within 50 feet of the vehicle transporting explosives. The vehicle operator will avoid driving in areas of dry vegetation that could possibly be ignited by the heat generated from the catalytic converter.

5.5.7 Weather and Environmental Considerations

Demolition operations will be conducted during daylight hours only. All vegetation including dry grass, leaves, and other combustible materials shall be removed within a radius of 5 feet around demolition shots and the area wet down. Prior to commencing demolition operations the Senior UXO Supervisor will obtain a local weather report. Demolition operations will not commence during periods of heavy rain, low total overcast, or during electrical storms.

5.5.8 Emergency Medical Support

Emergency medical support (911) will be provided by Calhoun County Emergency Medical Services. The telephone number of the responding medical facility will be posted in plain sight of project personnel. A complete first aid kit will be maintained on site by a person trained in CPR and first aid procedures.

5.5.9 Fire Support

The designated Fire Department and the TFO forester will be notified when demolition operations are to be performed. When the fire hazard is high due to dry conditions, demoliton operations will not commence unless mobile fire-fighting equipment is standing by in a safe location or Fire Department support can reach the demolition site within 5 minutes. UXO personnel will have shovels and water backpacks on site to aid in putting out small grass fires. At no time will the Fire Department or UXO personnel fight explosive fires. Upon completion of demolition operations the demolition site will not be released if any probability of fire exists.

5.5.10 Two-Man Rule

The Two-Man Rule is a concept of failsafe, where two knowledgeable individuals perform potentially hazardous operations where each is the safety for the other. The Two-Man Rule shall apply whenever explosives are handled, transported or during demolition operations. No one will handle or assemble explosive components alone.

5.5.11 Personnel Protective Equipment

All operations under this SOP will be conducted in Level "D" Personnel Protective Clothing, to include non-static producing clothing, gloves, and safety glasses.

5.6 SCRAP PROCEDURES

An inspection of the detonation crater and surrounding area will be conducted after each demolition operation. All metal fragments will be policed and containerized for later disposition.

5.7 RECORD KEEPING

The Demolition Supervisor will complete the Explosive Demolition Activities Checklist (Attachment 3-1), Explosive Demolition Log (Attachment 4-1), and the OE Acquisition and Accountability Log (Attachment 5-1), which tracks the OE from cradle to grave.

5.8 PREPARATION FOR OE DEMOLITION OPERATIONS

- Bring only sufficient explosives to meet requirements of the operation to the demolition site.
- Do not use improvised methods for initiating blasting caps.
- Use standard blasting caps with at least the equivalent of a commercial No. 8 blasting cap.
- Use electric blasting caps, other than M6, of the same manufacture for each demolition shot involving more than one cap.
- Initiators will be staged at least 25 feet from other explosives.

5.8.1 Conventional Non-Electric Priming

- The primary method of initiating all demolition shots will be electrical by use of the remote control firing device. Non-electric firing procedures are covered only for situations where High Electro Magnetic Radiation (EMR) or some other reason prohibits the use of an electrical firing system.
- Each new or partially used roll of safety fuse shall be test burned prior to each day's demolition operation. When testing the burn rate of safety fuse, cut off and dispose of the first six inches of the roll to prevent misfires caused by absorbed moisture. Next, cut off a six-foot length of safety fuse and test the burn rate. This test will be conducted at least 25 feet downwind from any explosives.
- Ignite safety fuse only by approved methods. Weatherproof fuse igniters are recommended.
- Keep blasting caps in approved, compartment containers. These containers shall be located at least 25 feet from other explosives.
- Handle non-electric blasting caps only by their open end except during attachment to safety fuse and/or detonating cord.
- Handle primed safety fuse with care to avoid contact between blasting caps and other hard objects.
- Maintain a minimum distance of 25 feet between the priming site for non-electric components and accessories and any supply of explosives, blasting caps or other positioned or primed charges.

- Do not prime more than the required number of charges. Any primed charges, which are not used, shall be expended; they shall not be returned to explosive storage locations.
- Do not force safety fuse into a blasting cap. If it does not enter easily, reject the cap and/or fuse.
- Handle safety fuse with care to avoid damage to the covering. In cold weather, warm the fuse slightly before use to avoid cracking.
- Do not force a blasting cap into explosives. Insert the cap into a suitable hole made by a punch.
- Do not crimp blasting caps by any means except an approved crimper. A crimp to close to the explosive can cause a detonation
- Do not insert anything into a cap to remove dirt or foreign material. Do not tap against a hard object or blow into the cap. Blasting caps are sensitive and may be exploded by such actions.
- Do not mold plastic explosives around blasting caps. Use a suitable punch to make a hole in the plastic.
- Do not bury blasting caps. Position the blasting cap above ground and run detonating cord to the buried shot.
- Handle any percussion detonator with the same precautions as a blasting cap.
- Do not confuse detonating cord with safety fuse.

5.8.2 Shock Tube Firing System Priming

NOTE

For remote initiation of the shock tube system by use of the remote controlled firing device see Attachment 6-1.

5.8.2.1 Shock Tube

The shock tube is a thin plastic tube of extruded polymer with a layer of special explosive material deposited on its interior surface. This special explosive dust propagates a detonation wave, which is normally contained within the plastic tubing.

Shock tube offers the instantaneous action of electric initiation without the risk of accidental initiation of the blasting cap (and the charge) by radio transmitters in the area, or by static electricity discharge. The shock tube medium is extremely reliable. Although the detonation along the shock tube is normally contained within the plastic tubing, burns may occur if the shock tube is held.

5.8.2.2 Detonation Procedures/Shock Tube Priming

Demolition activities are inherently hazardous and require strict adherence to approved safety and operational procedures. During demolition operations the DS will insure that:

- The area is clear and remains clear of personnel;
- Demolition shots are configured in a manner that precludes fragments from entering inhabited areas; use a minimum of 2 sandbags per demo shot.
- Positive control over the detonation is maintained.

5.8.2.3 Splicing Shock Tube

The high reliability of shock tube blasting cap is the fact that all of the components are sealed and unlike standard non-electric priming components, cannot be easily degraded by moisture. Cutting the shock tube makes the open end vulnerable to moisture. Care will be taken to keep moisture from the cut end of the shock tube. In general:

- Always use a sharp knife or razor blade to cut shock tube so the opening in the tubing will be unobstructed.
- Always cut shock tube squarely across and make sure the cut is clean.
- Use only the splicing tubes provided to make splices. Taping two cut ends of shock tube together does not make a reliable splice.
- Every splice in shock tube reduces the reliability of the priming system. Keep the number of splices in a shock tube line to as few as practicable.

5.8.2.4 Proper Splicing Procedures (Shock Tube)

The following is the proper splicing procedure for shock tube:

- Use a sharp knife or razor blade to cut approximately 18 inches from the previously cut off end of left over shock tube, whether or not it was knotted in accordance with the above guidance. Dispose of the 18-inch piece of shock tube in accordance with local regulations on such flammable items.
- Cut off the free, sealed shock tube end of the cap to be extended with a sharp knife or razor blade.
- Loosely tie the two shock tube ends to be sliced together in a square knot. Leave at least a two-inch free end of each shock tube beyond the knot. Push the shock tube lightly to tighten the knot, but not so tight as to significantly deform the shock tube in the knot.
- Push one of the free shock tube to be spliced firmly into one of the pre-cut splicing tubes at least ¼ inch. Push the other shock tube end firmly into the other end of the splicing tube at least ¼ inch.

- Spool out the desired length of shock tube and cut it off with a sharp knife or razor blade.
- Attach an initiator to the cut end of the shock tube spliced to the blasting cap in accordance with standard operating procedures or tie a tight overhand knot in this end if it is to be actuated by another blasting cap or detonating cord.

5.8.2.5 Set Up

- Lay out required length of shock tube from demo area out to firing point (see splicing Note).
- Attach EZTL 30 using splicing tube supplied (or equivalent) bunch block, to lead line at demo site. Secure cap (block) with sand bags.
- Run additional lead line from bunch block to UXO (see Figure 1)

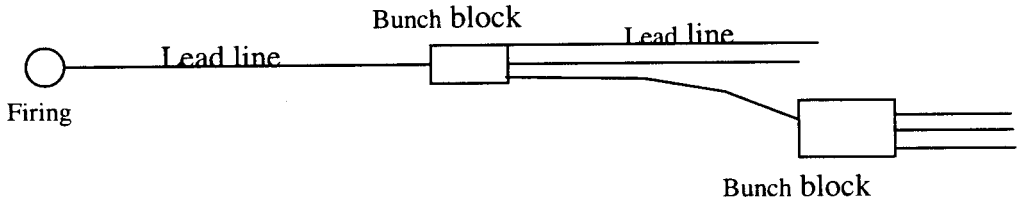

Figure 1

- 6 additional leads only from bunch block
- use additional bunch block if required
- At ordnance item, place perforator and 2-3' length of detonating cord – secure with sandbags. (See Figure 2)

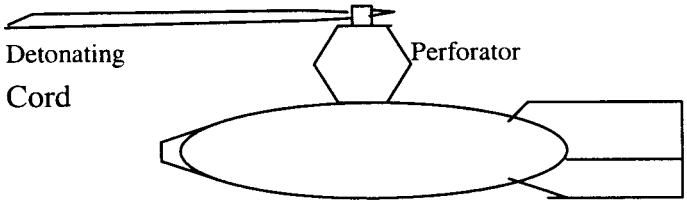

Figure 2

- At ordnance site using splicing tube, attach detonator assembly to lead tube then secure detonator to detonating cord (see Figure 3)

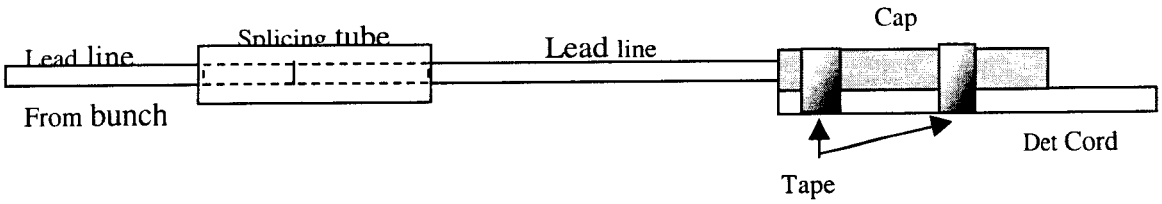

Figure 3

- Check when complete and depart area for firing point
- Attach shock tube to firing device, lead primer into firing device.
- Request permission to fire, give verbal warning, activate firing device.
- Two personnel depart down range to check shot. When "all clear" is given, team returns to demo area for check and clean up.

5.8.2.6 Misfire With Shock Tube

The following steps should be performed in the advent of a misfire to rectify the situation:

- The most common cause of a misfire in a shock tube priming system is the initiating element. The most failure with this system is the primer not firing.
- If two or three retries with the igniter does not result in it firing, cut the shock tube, replace the igniter with a new one and repeat firing procedure.
- Another misfire mode with the igniter is that the primer fires, but blows the shock tube out of its securing mechanism without firing it. The corrective action is to cut approximately six inches from the end of the shock tube, replace the igniter, and repeat firing procedure.
- If the igniter appears to have functioned properly (primer pops and smokes), but the charge did not fire, cut a one-foot section from the shock tube starting approximately six inches from the igniter. Hold the one foot piece of shock tube so that one end is over the palm of your gloved hand and gently blow through the other end with an asperator. If a fine powder is blown from the shock tube, it has not fired. If this is the case, install a new igniter on the freshly cut end of the priming shock tube.
- If the igniter/initiating element functioned properly and no fine powder was blown from the shock tube in the previous step, or the shock tube was heard to fire or its flash was seen, observe the standard one hour waiting time before going downrange to check the next element(s) in the priming train. Shock tube blasting caps are non-electric blasting caps and the standard rules apply in the event of a misfire.
- After the one-hour waiting time has passed, proceed downrange and check the detonator of the first component in the priming train. If the detonator has not fired, attach an identical component to the shock tube (or detonating cord) of the

uninitiated second component close to the unfired detonator of the failed component. Lay out the shock tube of the replacement component back to the site from which the shot is to be initiated and repeat the standard initiator attachment and fire when it is safe to do so.

- If the first component of the firing train was not the one which failed, check out each succeeding component until the failed one is found and replace the failed or fired relay components back to the initiating site as in step 6. To determine if the shock tube has fired at a particular point, step 4 may be done with a one-foot section of shock tube cut from the suspect area.
- Never yank or pull hard on the shock tube, it may actuate the detonator.

5.8.3 Electric Priming

- Caps will be separated at least 25 feet from other explosions until needed for priming.
- The electrical firing system with the remote controlled firing device is the preferred method for initiating explosive charges. The command control system provides more positive control of the shot than a time delay (non-electric) system.
- Use only the special silver-chloride dry cell battery in the testing galvanometer. Other type cells may provide sufficient voltage to fire the blasting cap.
- Place the blasting cap under a sandbag before removing the shunt and testing the continuity. Unfold the legs so that the cap is as far as possible from the UXO technician and pointing away from him. Secure leg wires to prevent the cap from moving during the test.
- Caps will be placed 50 feet downwind from other explosives when testing for continuity.
- Test electric blasting caps for continuity prior to connecting them to the firing circuit. Upon completion of testing, the lead wires will be short-circuited by twisting the bare ends of the wire together. The wires will remain short circuited until ready to connect to the firing circuit.
- Do not connect the blasting cap into the firing circuit until all pre-firing tests have been completed and it is time to arm the system.

5.8.4 Priming with Detonating Cord

- Preparation of donor explosives. The primary donor explosives for use in disposing OE items will be the one pound pentolite booster, plastic explosives, jet perforators, detonating cord and electrical blasting caps.
- One Pound Pentolite Booster-Insert 80-grain detonating cord into the detonator

well all the way through and back through other hole. When using more than one booster insert detonating cord through each of the boosters' detonator well and secure to keep them from sliding along the detonating cord.

- Plastic explosive- Insert knotted detonating cord into the plastic explosive- run detonating cord to the initiating point
- Jet Perforator-Using the detonating cord clip secures detonating cord to the Jet Perforator. Place the Jet Perforator on the OE item using tape or other suitable methods to prevent Jet perforator from moving. For tamped shots use a box or other suitable material to make a stand off to prevent soil from getting between the perforator and OE item.

5.8.5 Preparation and Priming, Electrical Firing System

- An electric firing system consists of two electric blasting caps, firing wire and a remote controlled firing device. The methods and sequence of operations of electric priming are described below.
- Telephone or radio communications will be established with emergency response personnel. No radio transmissions will take place during positioning or connecting of electrical initiating devices.
- Control of the site must be maintained during demolition operations. All personnel who are not essential to demolition operations must evacuate to a safe area. Access roads, which enter the blast area, will be blocked during explosive demolition operations to ensure that unsuspecting individuals are not placed in jeopardy by the explosion.
- The Senior UXO Supervisor or designee will assure the area is clear of personnel and equipment prior to permitting attachment of the initiation devices to the priming charge.
- The Senior UXO Supervisor or designee will conduct a 360-degree visual search for aircraft, boats or personnel near the exclusion before initiating any explosives.
- Prior to conducting an On-site demolition operations, the SUXOS or designee will conduct a safety briefing which will include, as a minimum, phases of the operation, review of explosive handling and EMR precautions, location of safe area, emergency notification procedures, site specific characteristics, type of OE being destroyed, placement and quantity of counter charge, misfire procedures, post clean up of site, care and handling of explosive materials, personal hygiene, two man rule, potential trip/fall hazards, location of On-Site vehicle, wind direction, location of first aid kit and fire extinguisher.
- A minimum of two qualified personnel, one of which will be the assigned UXO Technician III/Demolition Supervisor, will conduct demolition operations. Control initiation devices will remain with the supervisor until attachment to the firing circuit.

- Positive control is required; initiation devices will be limited to those requiring electrical current.
- In the event of a fire on the range evacuate to the fragmentation distance until the fire is extinguished.
- Prepare and place all explosive charges as prescribed above.
- Locate a safe position for receiver, cut off a length of wire (less than 100 feet) that will reach receiver and charges.
- Conduct a continuity check of the wire with a galvanometer. Twist free ends of wire together to prevent an electric charge from building up in firing wire.
- Test each blasting cap with a galvanometer and twist free ends of cap lead wires together to prevent electric charge build-up in lead wires.
- Connect blasting caps in a parallel circuit and connect to extension wires.
- Connect extension wires to receiver.
- Secure caps onto detonating cord.
- Retreat to safe area,
- The Demolition Supervisor verifies that exclusion zone is clear,
- The Demolition Supervisor will give a five minute warning on the hand held radio
- Arm command firing device,
- Designated UXO technician gives three, loud fire in the hole,
- Demolition Supervisor gives permission to fire shot,
- Designated UXO technician fires demolition shot.

5.8.6 Electric Misfire Procedures

A thorough check of all equipment, firing wire and detonators will prevent most misfire situations. In order to prevent electric misfires, one technician must be responsible for all electrical wiring in the circuit. If a misfire does occur, it must be cleared with extreme caution. Two personnel will investigate the misfire and correct the situation.

- Check connections and make a second attempt to initiate charge.
- If unsuccessful, disconnect and connect to another blasting machine (if available) and attempt to initiate charge.
- If unsuccessful, disconnect power source and shunt the firing wires.
- Wait 30 minutes from the last initiation attempt.
- After the wait time has expired a designated technician will proceed down range to inspect the firing system; a safety observer must watch from a safe area.
- Connect a new electric firing system and prime the charge without disturbing the

original firing system.

- Follow normal procedures for initiating charges.

5.8.7 Non-Electric Firing Procedures

- After all shots have been set up and tamped with a detonating cord lead in the Demolition Supervisor will have all personnel leave the area except the designated arming teams.
- The Demolition Supervisor will verify that the area is clear.
- The Demolition Supervisor will designate the arming team when to arm the shots.
- The Demolition Supervisor will designate to each arming team when to pull the fuse lighters and start the time fuse burning.
- The arming team will give a loud fire in the hole and pull the fuse lighters and walk out of the area to the vehicle and retreat to a safe area.
- The Demolition Supervisor will give a fire in the hole over the radio when the safety fuse starts burning to let all site personnel know that the firing sequence has been initiated.
- After all arming teams have initiated their shots and departed the area; the Demolition Supervisor will depart with the last team to the safe area.

5.8.8 Non –Electric Misfire Procedures

- Wait one hour after the maximum delay predicted for any part of the demolition shot
- Demolition Supervisor and one UXO technician will investigate the shot. The Demolition Supervisor will approach the shot while the second team member remains a safe distance from the shot.
- The Demolition Supervisor will cut the detonating cord forward of the misfired cap.
- The Demolition Supervisor will tape a new non-electric firing assembly to the detonating cord lead in or a new counter charge to the OE item if the shot did not have a detonating cord lead in.
- The Demolition Supervisor will standby to pull the fuse lighter.
- The previously described procedures for non-electric firing will be followed.

5.8.9 Post Demolition Procedures

- At the conclusion of detonation the Demolition Supervisor will inspect the site prior to allowing other personnel to enter the blast area.
- UXO Technicians I, II, or III will conduct a 5 foot radius magnetometer sweep of the detonation site to gather fragments.
- Intact ordnance items that failed to detonate will be counter-charged and blown in place.
- Explosive residue will be collected and detonated. Metal fragments will be examined to ensure complete detonation of explosive material
- All Clear Signal – The Demolition Supervisor will report all clear over the FMC radio net when the area is clear.

5.8.10 Arming and Firing

Arming and firing shots with commercial explosives will be in accordance with above procedures for arming and firing electrical or non-electrical firing systems.

5.9 QUALITY CONTROL

Quality control is performed to ensure that the ordnance was completely destroyed in the detonation process. The UXO Technician III will ensure that the procedures are implemented and are being followed as defined in the *Site-Specific Work Plan* and listed below.

- Perform follow-up QC on demolition procedures.
- Ensure proper exclusion zone controls.
- Ensure proper demolition procedures are performed in accordance with this procedure.
- Ensure demolition procedures are conducted in accordance with federal, state and local laws and regulations for the use, handling, storing, and transporting of explosive materials.
- Ensure the proper use of explosives per TM 60A-1-1-31 for ordnance encountered.
- Perform QC checks on 10% of all demolition craters prior to backfill operations. (Designated QC personnel).
- Escort designated QA representatives to perform QA checks prior to backfill operations, if required.

6.0 REFERENCES

- Department of Defense. 1997. DOD Ammunition and Explosives Safety Standards. DOD 6055.9-STD, July 1999 with changes of 5 July 2000.
- U.S. Army. 1987. Ammunition and Explosives Safety Standards. Army Regulation 385-64, 28 November 1997
- Joint Service. 1990. Explosive Ordnance Disposal Procedures, Protection of Personnel and Property. Bulletin TM 60A-1-1-4, Revision 3, 11 April 1998.
- Joint Service. 1994. Explosive Ordnance Disposal Procedures, General Information on EOD Disposal Procedures. Bulletin TM 60A-1-1-31, Revision 1, 31 December 1997.
- U.S. Army Corps of Engineers. 1996. Safety and Health Requirements Manual. EM 385-1-1, 3 September 1996.
- U.S. Army Corps of Engineers Huntsville, Personnel/Work Standards, DID OE-025, 3 March 2001.

Additional Reference Material

• ORD DATA	ORDNANCE IDENTIFICATION GUIDE
• TM9-1300-200	AMMUNITION GENERAL
• TM9-1300-214	MILITARY EXPLOSIVES
• TM9-1901	ARTILLERY AMMUNITION
• TM9-1904	AMMUNITION INSPECTION GUIDE
• EODB 1385-1	EOD DISPOSAL
• TM9-1325-200	BOMBS AND BOMB COMPONENTS
• TM9-1330-200	GRENADES, HAND AND RIFLE
• TM9-1345-200	LAND MINES
• EM 385-1-1	SAFETY AND HEALTH REQUIREMENTS MANUAL
• ATF-P-5400.7	EXPLOSIVE LAWS AND REGULATIONS
• 49 CFR 171/178	MOTOR CARRIER SAFETY REGULATIONS

ATTACHMENT 1-1

Demolition Equipment Checklist

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ATTACHMENT 1-1

DAILY DEMOLITION EQUIPMENT CHECKLIST

Date_____ **Demolition Supervisor**_____

EQUIPMENT	QUANTITY	COMMENTS
Explosive Vehicle	1/	
Personnel Vehicle / Mule	3/	Depends upon area
Camcorder/digital camera	1/	
Handheld Radios	TBD /	Depends upon size of operation
Cellular Telephone	1/	
Remote Firing Device	1/	
Carpenter's Ruler	1/	Demo box
Approved Magnetometer	1/	
Shovel, round point, long handle	3/	
Scorpion Blasting Machine	1/	Demo box
Tape, duct	6/	Demo box
Tape, measuring, 200 Feet	2/	Demo box
Tape, electrical	6/	Demo box
Tape, Caution	1/	Demo box
Traffic Cones		
Toolbox, general hand tools	1/	
Galvanometer or test set	2/	
Firing Wire	1 roll/	Demo box
Knife	1/	Demo box
Survey Equipment(GPS/Garmin)	1/	
MK 663 Mod 0	1/	
Mushroom	1/	
Face Shield (as required)	2/	Demo box
Welder's Gloves (as required)	2/	Demo box
Welder's Apron (as required)	2/	Demo box
Garden Rake	2/	
Power Tools 9 (as required)	/	Type of tool – situation dependent

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ATTACHMENT 2-1

Daily Health and Safety Equipment Checklist

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ATTACHMENT 2-1

DAILY HEALTH AND SAFETY EQUIPMENT CHECKLIST

Date_____ **Demolition Supervisor**_____

EQUIPMENT	QUANTITY	COMMENTS
Air horn, emergency	1/	
Burn Blanket	1/	
Burn kit	1/	
Emergency eye wash (portable)	1/	
Fire blanket	1/	
Fire extinguisher, 10-pound ABC	1/	In each vehicle
First aid kit	1/	
Gloves, leather (Cut Resistant)	3/	Personnel issue
Goggles	3/	Personnel issue
Rain suit	3/	Personnel issue
Safety vest	3/	Personnel issue
Stretcher	1/	Part of Mountain Rescue Equipment
Water, 5-gal bottle (emergency shower)	1/	
Water, drinking- 1 liter per person	3/	5 gallon container
Water Backpack	1/	Personnel issue
Hearing Protection	1/	Personnel issue
Mountain Rescue Equipment (Staged at Bldg. 698)	1/	In tool room
Safety Shoe, Composite Toe		Personnel issue
Spill/Absorbent Material	1/	
Chaps, Kevlar (as required)	1/operator	When using chain saw
Pressure Washer (as required)	1/	If equipment DECON is required

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ATTACHMENT 3-1

Explosive Demolition Activities Checklist

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ATTACHMENT 3-1

EXPLOSIVE DEMOLITION ACTIVITIES CHECKLIST

Date_____ **Team**_____

FUNCTION	DATE/TIME	SIGNATURE
Person Finds Suspect OE		
Notifies Transition Force Operations		
Transition Force Operations		
Notifies USAESCH Safety Representative		
Notifies FW SUXOS		
Senior UXO Supervisor		
Assigns Demolition Supervisor (UXO Technician III)		
Verify Planned Exclusion Zone		
Notify Listed Activities -USAESCH Safety Representative -Fort McClellan Transition Force Operations -Medical Facility -Fire Department		
Demolition Supervisor (UXO Technician III) -Designate Demolition Team -Research OE Item to be Disposed/Vented -Define Exclusion zone requirement CEHNC_____ DOD 6055.9 STD_____ -Review Emergency Procedures -Schedule Demolition Time		
Explosive Team		
Demolition Supervisor start demo log		
DS designate 2 UXO technicians to pick up explosives - Driver of Explosive Vehicle -Pick up Demo equipment/Demo book/Safety equipment at FWENC Compound -Inspect explosives vehicle and fill out DD626 -Depart FWENC to ASP -Placard Vehicle - Load required explosive material - Nonel Caps _____ - Detonating Cord _____ - Bunch Block _____ - Perforators _____ - Nonel _____ - Boosters _____ - Follow preplanned route to disposal site - Park vehicle in safe area		

FUNCTION	DATE/TIME	SIGNATURE
Demolition Supervisor		
Assemble demolition team		
Verify that USAESCH Safety Representative is on site		
Verify that all required material is on site		
Complete H&S checklist/Demo Brief		
Designate emergency vehicle		
Designate emergency evacuation route/rally point (Primary and Secondary		
Review emergency response procedures (911)		
Review EZ requirements with map		
Assign road guards w/radios		
Review demolition procedures -Assign setup personnel -Assign Nonel personnel		
Review communications procedures		
Verify EZ is set		
Notify SUXOS that operations are commencing		
Issue explosives (maintaining proper distance between explosives and caps)		
Start setup		
Complete setup		
DS give 5 minute window to TFB		
DS give 5 minute warning over NEXTEL net.		
Fire shot		
Verify all clear		
Notify TFB of all clear		
Sweep demolition site with magnetometer and pickup scrap metal		
Complete OE accountability log		
Complete explosive demolition log		
Transport OES/NORS to scrap processing site		
Complete demo log		
Demobilize demo site		

ATTACHMENT 4-1

Explosive Demolition Log

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ATTACHMENT 4-1

EXPLOSIVE DEMOLITION LOG

Start Time: _____ **Stop Time:** _____

Demolition Supervisor Signature: _____ **Date:** _____

OE/UXO DISPOSED (list item and quantity of each item):

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

DONOR EXPLOSIVES USED:

_____
_____
_____
_____
_____
_____
_____
_____
_____

REMARKS (note any problems and resolutions, such as misfires, low order, etc.):

_____
_____
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_____
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ATTACHMENT 5-1

OE Acquisition and Accountability Log

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ATTACHMENT 5-1

OE ACQUISITION AND ACCOUNTABILITY LOG

UXO TEAM_____ DATE_____

ACQUISITION DATA

Sample Area Number	
Ordnance Length (inches)	
Ordnance Diameter (inches)	
Weight (lb./oz)	
Ordnance Type (bomb, rocket, projectile, hand grenade, mortar, rifle grenade, pyrotechnics, small arms, etc.)	
Photo roll number/disk number	
Photo exposure number/digital file number	
Video Marker – Start	
Video Marker – Stop	
Surveyed Location	
Ordnance description	

OE DISPOSITION

SAFE HOLDING AREA	DATE	INITIAL	TRANSFERRED TO	DATE	SIGNATURE

DESTROYED BY	DATE	SIGNATURE

Comments:

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_____

Senior UXO Supervisor_____

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ATTACHMENT 6-1

Demolition Operations, Remote Firing Device (RFD)

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ATTACHMENT 6-1

DEMOLITION OPERATIONS
REMOTE FIRING DEVICE (RFD)

1.0 Ready the system at the site:

Remove the dust cover from the antenna connector. Install the antenna onto the connector. For shock tube initiation remove the shock tube initiator tip from the tool pouch located in the receiver's lid and place it on the shock tube terminals.

Note:

Each RFD system has a unique "address" number. It is a matter of safety that no two systems will be manufactured with the same address. All transmissions between the units (controller and remote) are prefixed by the system number. No single unit will be able to "talk" to units of other systems. Addresses are not field programmable.

Note

Ensure that the desired initiation method (Shock Tube) is selected using the "Select" switch.

WARNING:

The electric detonator and the shock tube initiator circuits could detonate charges regardless of the Select switch position. NEVER connect explosive charges to both the electric detonator and the shock tube initiator at the same time. Either charge could be initiated.

CAUTION:

If the green Ready LED, which corresponds to the "Select" switch on the remote does not light, the remote's self check function has detected an internal circuitry error. When this condition has been detected, the initiator circuitry remains shunted and will not fire. DO NOT CONNECT EXPLOSIVES. Do not attempt to use the system until serviced by authorized technicians.

1.1 Controller Operational Procedures

WARNING:

Do not connect an explosive charge to the remote receiver unless the red ARMED LED is off and the green READY LED is illuminated.

1.1.1 The controller (transmitter) in this RFD system has 5 watts of transmitting power output. Do not operate the controller within 100 feet of blasting caps or main charge explosives.

1.1.2 When explosives are connected to the remote receiver, do not insert the key into the controller (transmitter) until actually ready to shoot (all personnel must be clear of the blast). The person connecting explosives should carry the controller key to prevent unintended firing and /or RF emissions. Do not test the RFD within 100 feet of explosives or wires leading to them.

1.1.3 Using the key, turn the "POWER" switch to the clockwise position. The yellow LED at the top of the unit will indicate when the power is on. If the yellow LED flash's, the controller battery is low and must be replaced or charged.

1.1.4 Momentarily depress the controller "STATUS" button. The yellow TRANSMIT LED will flash for approximately 1 second. At the end of this time the green READY LED will come on and remain constant. The constant green LED indicates the remote receiver is on-line and is not armed.

1.1.5 Turn the controller off and remove the key until the remote receiver is in place, wires connected to the shoot and all personnel are clear of the blast area.

WARNING:

Do not connect an explosive charge to a remote receiver unless the green READY LED is lit and the red ARMED LED is off.

1.1.6 Place the remote receiver in an area free from obstructions and far enough from explosives to avoid damage from the detonation. Using sandbags or other suitable materials, protect the remote receiver from damage due to fragments thrown from the detonation.

CAUTION

Do not connect an explosive charge to the remote receiver unless the selected green READY LED and the yellow BATTERY LED are both illuminated and are not flashing. Make sure the red ARMED LED is off.

1.1.7 Ensure that the remote receiver indicates a READY condition for the selected initiation method (green READY LED on steady, red ARMED LED off). If the selected initiation method is ready, and the shot is set up, you may proceed to connect the shock tube to the igniter tip as follows:

1.1.8 Request permission to prime the shot.

Prime the cap(s) to the Demo materials. Connect the non-electric shock tube carefully to the igniter tip. The tube should be wrapped around through the holes in the tip's molded casing to keep it from falling out. Then plug in and return to the firing point.

2.0 System Safety Feature:

Once ARMED, the remote receiver must receive a FIRE signal within 2 minutes. If the remote receiver does not receive a FIRE signal within 2 minutes, it will automatically return to the unarmed state. The voltage is dissipated internally and removed from either the shock tube terminals or the binding posts.

3.0 The Remote Receiver:

Lift the cover on the "POWER" switch, insert the key and turn it clockwise to activate the remote receiver. The yellow BATTERY LED and the green READY LED for the selected initiation method illuminate after approximately 3 seconds to allow time for internal self-checks. The green READY LED indicates the selected circuit is not armed and is operating properly. The red ARMED LED should remain off. In this configuration all voltage is shunted away from the electric detonator binding posts and shock tube terminals. If the yellow LED is flashing, the remote receiver should be removed from operation and it's battery recharged.

3.1 To arm the remote receiver, push the "ARM/DISARM" switch to the left and hold for one (1) second. The red ARMED LED will flash for approximately 18 seconds and then remain steady. THE REMOTE RECEIVER IS NOW ARMED.

3.2 Firing the remote receiver:

To fire the remote receiver, put the safety cover on the "FIRE" switch in the upright position and push the "FIRE" switch forward. The operator should get an indication of shot initiation. The ARMED LED should go out and the green READY LED will remain

steady.

3.3 Disarming the remote receiver:

To disarm the remote receiver that has been armed, press the "ARM/DISARM" switch to the right. The remote receiver will return to the DISARMED mode in approximately two (2) seconds. Voltage is dissipated internally, and the binding posts and shock tube terminals are both shunted.

Caution

> Do not assume the disarm command has been received by the remote receiver unless this status is confirmed on the controller faceplate. If distance is the problem, move closer to the receiver and follow standard disarming procedures. The STATUS and DISARM switches may be pressed repeatedly as you move closer to the receiver.
>
> DO NOT APPROACH THE REMOTE RECEIVER UNTIL YOU HAVE RECEIVED CONFIRMATION THAT THE REMOTE RECEIVER IS DISARMED.

NEVER approach the remote receiver and push the "FIRE" switch. DO NOT position the controller within 100 feet of electrical detonators or other explosives. Turn off the controller (transmitter) and remove the key. Recover the remote receiver.

ATTACHMENT 7-1

Demolition Operations, Scorpion Blasting Machine

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ATTACHMENT 7-1

DEMOLITION OPERATIONS
SCORPION BLASTING MACHINE

WARNING

Do not connect lead lines or non-electric tubing until ready to fire/detonate the shot

1.2 Testing Blasting Machine and Circuit

Test the blasting circuit with a blasters multimeter or galvanometer. To test the Scorpion Blasting Machine and before connecting electrical lead lines depress the "Charge" switch until "Ready" light is lit. Without releasing the "Charge" switch, depress the "Detonate" switch. You will hear the pop of the machine.

1.3 To Detonate Electric Blasting Caps

Check the area to ensure that it is safe to detonate the explosive charge. Test the blasting machine and firing circuit as outlined above, connect the lead wires to the terminal at the top of the machine. After again ensuring that the area is clear to fire the charge, depress the "Charge" switch until the "Ready" light is lit. Holding the "Charge" switch down depress the "Detonate" switch to fire the charge.

1.4 To Detonate Nonel Non-Electric Shock Tube

Check the area to ensure that it is safe to detonate the explosive charge. Test the blasting machine as outlined above with only the initiation nozzle in place. Thread the Nonel line through the small hole in the initiation nozzle and loop it into the top hole of the nozzle. Insure that the Nonel line fits over the metal pin on the inside of the Initiation Nozzle. To fire the Nonel line, depress the switch on the "Right Side" of the blasting machine for one second. The line will fire when the side switch is released.

WARNING

If you need to abort the firing of the explosive charge, do not release the firing switch until you have removed the "Initiation Nozzle". Failure to hold the firing button down before removing the initiation nozzle from the top of the blasting machine will result in an inadvertent detonation

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