

APPENDIX A

**ACCIDENT INVESTIGATION BOARD
APPOINTMENT LETTERS**

APPENDIX B

**BOARD MEMBERS AND ADVISORS
QUALIFICATIONS**

APPENDIX B

BOARD MEMBERS AND ADVISORS QUALIFICATIONS

NAME:

Robert W. Barber

AREA OF RESP.:

DOE Accident Investigation Board Chairman

ASSOCIATION:

U.S. Department of Energy, Office of Risk Analysis and Technology

EXPERIENCE:

36 years

- **U.S. Department of Energy**

- Over 36 years experience in safety activities including radioisotope licensing, management of large complex nuclear safety projects, extensive appraisal and investigation leadership roles ranging from nuclear safety to worker occupational safety. Led a number of complex engineering design reviews of the safety of nuclear facilities including systems analysis and the effects of steam and water transients in hydraulics systems. Managed DOE's support for the Nuclear Regulatory Commission's reactor safety program which included development and testing of computer codes to predict transient effects in water steam systems. Developed DOE's Technical Safety Appraisal Program which included Assessments of operating practice at DOE's facilities. Recent positions include:
- Director, DOE Office of Field Support. Responsible for field support and assistance to DOE's worker safety and health, chemical safety, site cleanup, aircraft operations, high explosives and counterfeit parts programs.
- Director, DOE Office of Risk Analysis and Technology. Responsible for nonnuclear risk analysis, natural phenomena, hazardous materials transportation, and aircraft safety oversight, and policy.
- Director, DOE Office of Integration. Responsible for analysis and oversight of operational safety issues, safety compliance, safety and health accident/incident analysis, and safety and health training.
- Director, DOE Office of Nuclear Safety. Responsible for oversight, policy, and assistance in nuclear safety, health physics, and emergency preparedness.

EDUCATION:

B.S., Chemistry, Tufts University
B.S., Chemical Engineering, Tufts University

Other:

Graduate, Oak Ridge School of Reactor Technology
Charter Member of Federal Senior Executive Service
Graduate, Federal Executive Institute

NAME: James S. Campbell

AREA OF RESP.: DOE Accident Investigation Board Member

ASSOCIATION: U.S. Department of Energy, Oak Ridge Operations, Construction and Engineering

EXPERIENCE: 28 years

- **Construction and Engineering**

- DOE Certified Accident Investigator. Participated as a board member in four Type A investigations, one Type B investigation and two Type C investigations.
- Manager. Design and construction of line-item construction projects. Provided oversight of facilities-related programs including site planning and value engineering.

- **U.S. Army Missile Command**

- Operations and Maintenance of Mechanical Utilities systems.
- Design and construction of mechanical facilities systems.

- **Private Industry**

- Designed mechanical systems for construction in paper and chemical industries.

EDUCATION: B.S., Mechanical Engineering, Auburn University
B.S., Forestry, Auburn University
Graduate Studies in Systems Engineering, University of Alabama, Huntsville

NAME:

David E. Freshwater

AREA OF RESP.: DOE Accident Investigation Board Advisor

ASSOCIATION: Science Applications International Corporation, Washington, DC (Consultant)

EXPERIENCE: 16 years

- **Science Applications International Corporation, 5 years**

- Assisted development of DOE Orders and guidance updating the Emergency Management System.
- Participated in the pilot Technical Assistance Appraisal of the Emergency Management Program at the Idaho National Engineering Laboratory.
- Participated in 8 Technical Safety Appraisals at Defense Programs facilities.
- Participated in the DOE Headquarters ORR for Cold Chemical Runs at the SRS DWPF.
- Participated in the evaluation and control of 17 emergency readiness exercises.
- Member of the Environmental Protection and Waste Management Technical Review Group for Safety Analysis Reports.
- Updated the Environmental Protection Agency's plans and procedures for response to a radiological emergency.

- **United States Army, 11 years**

- Assisted in the development and publication of plans ranging from interregional, superpower conflict to the emergency evacuation of U.S. citizens from a specific country or area.
- Improved security plans for ten installations against both terrorist and civil disturbance/demonstration threats.
- Developed emergency evacuation plans for U.S. citizens within a large area of West Germany.
- Organized and trained the security and medical teams responsible for responding to nuclear accidents/incidents within a wide area of West Germany.

EDUCATION:

B.S., Engineering, U.S. Military Academy, New York, 1979
M.S., Technology Management (Pending thesis), Southern College of Technology, Georgia

OTHER:

Certified Emergency Manager, National Coordinating Council on Emergency Management, 1994

Engineer-in-Training, Pennsylvania, 1979

NAME:

Dennis R. Hickman

AREA OF RESP.:

MORT Analysis

ASSOCIATION:

Westinghouse Savannah River Company

EXPERIENCE:

12 years

- **Westinghouse Savannah River Company (WSRC)**
 - Security Systems Analysis, Safeguards & Security Systems Department. Conduct and trending analysis on security systems performance. Review policies and procedures impacting security systems Conduct of Operations. Conduct performance tests on new or modified systems.
 - Chairman Security Systems Performance Review Board, Safeguards & Security Systems Department. An established forum to discuss, document, and abate issues impacting security systems Conduct of Operations.
- **Wackenhut Services Incorporated Savannah River Site (WSI-SRS)**
 - Electronic Safeguards & Security System (E3S) Task Force Leader, Planning Division. Development and implementation of plans for integrating the protective force to the E3S.
 - Manager, Zone Operations Division. Protection of assets and personnel against the postulated DOE threat.
- **United States Marines Corps (USMC)**
 - Military Police, NonCommissioned Officer (NCO).

EDUCATION:

ABA Business Administration; Phillips College

OTHER:

Root Cause Analysis Training (1992)
Certified Protection Profession (CPP) American Society for Industrial Security (ASIS) 1993

NAME:

Janice E. Hill

AREA OF RESP.: DOE Accident Investigation Report Coordinator

EXPERIENCE: 16 years

- **Battelle Seattle Research Center**

- Researcher. Supports and assists DOE-HQ with Type A Accident Investigation processes and procedures, and provides support for onsite assessments and reviews. Provided onsite administrative support for the Type A Investigation of the Arc Blast at Building 9725 Resulting in an Injury at Oak Ridge, the DOE-HQ Order Compliance Review at the Los Alamos TA-55 facility, and the EH Oversight Assessment of the Operational Readiness Review of the Rocky Flats Building 707.

- **EG&G Idaho, Inc.**

- Program Administrator. Provided onsite administrative support for the DOE-HQ Type A Accident Investigation of the Hanford Pit Fatality, the DOE-HQ Spent Fuel Initiative, the Chemical Safety Oversight Review at Los Alamos National Laboratory, and the Special Review of OSHA Programs for the Hanford High-Level Waste Tanks. Maintained rosters of consultants and laboratory personnel in all technical disciplines, and staffed assessment and review teams.
- Report Coordinator. Provided onsite support to the Safety and Health Subteam on the Tiger Team Assessments at Paducah Gaseous Diffusion Plant, the Solar Energy Research Institute, the Los Alamos National Laboratory, the Naval Petroleum Reserves, and the Strategic Petroleum Reserves.

EDUCATION:

Coursework in music education through the University of Arkansas at Little Rock and completed coursework in computers and speedwriting through the Eastern Idaho Technical College. Completed numerous professional workshops, general management, and administrative skill courses.

OTHER:

Certified Trainer, Crosby Quality Education System

NAME: Theodore O. Macklin, Jr.

AREA OF RESP.: DOE Accident Investigation Board Advisor

ASSOCIATION: Office of Environmental Management Program Office Safeguards and Security Advisor

EXPERIENCE: 19 years

- **U.S. Department of Energy**
 - Support Environmental Management's Office of Facility Management and Transition (EM-60), Rocky Flats Program Office (EM-64), and Office of Safeguards and Security (EM-15).
 - Office of Defense Programs Rocky Flats Program Office (DP-6.1) Safeguards and Security Advisor.
 - Site Security Survey and Exercise Advisor-Protective Force - Rocky Flats Environmental Technology Site; Oak Ridge Y-12, K-25, Paducah Gaseous Diffusion Plant; Lawrence Livermore National Laboratory.
- **U.S. Department of Defense**
 - Team Leader, US Navy "Red Cell" Anti-Terrorist Program.
 - U.S. Navy Special Warfare (SEAL) Officer, SEAL Teams 2 and 6.
 - U.S. Navy Surface Warfare Officer, USS Bowen (FF-1079), Nuclear Weapons Security Officer.
- **Private Industry**
 - General Partner, Security Assistance and Special Operations (SASO). Security planning and exercise development for Fortune 500 companies.
 - Consultant, Brown & Root International Construction Corporation. Planned mine clearing and oil fire operations in the U.S. Sector - Post Gulf War Kuwait.

EDUCATION: MBA, Georgetown University (cand.)
BA, Holy Cross

OTHER: Advisor, President Bush's Commission on Aviation Security and Terrorism, 1990: The Downing of Pan Am Flight 103.

NAME: Rebecca M. McManus
AREA OF RESP.: Accident Investigation MORT System Analyst
ASSOCIATION: Westinghouse Savannah River Company
EXPERIENCE: 23 years

- **Westinghouse Savannah River Company (WSRC)**
 - Team Leader, Safeguards, Security and Emergency Services Division. Development of Security Self Assessment Program including Trends Analysis, Root Cause Analysis, Performance Indicators, tracking Corrective Actions and Issues Management controls.
 - Sector Manager, SS&ES. Management of Protection Program Operations for three Class A facilities containing Category I-IV Special Nuclear Material and classified information up to and including secret/restricted data.
- **E.I. du Pont de Nemours, Inc., Savannah River Plant**
 - Research and Development Supervisor, Management of Laboratory Services Control Room Operations and Facility Custodian.
 - Safety Engineer, Development, compliance, and implementation of safety rules, regulations and OSHA requirements. Conducted Unusual Accident/Incident investigations resulting from unexpected loss of equipment and/or injuries to personnel.
 - Construction Liaison Foreman, Planned and implemented processes to complete Construction/Contractor activities to minimize disruption of production operations.
- **August Kohn and Company, Inc., Mortgage Bankers**
 - Corporate Accountant, Recorded transactions into account ledgers for corporate offices and management.
 - Foreclosure Clerk, Processed foreclosure claims with attorneys for FHA, VA, and Conventional home mortgage loans.

EDUCATION: Associate Degree in Business, Palmer College

OTHER: Safety Fundamentals, 1985
MORT Accident Investigation, DOE/EG&G, 1986
Managing Safety, 1987
Security Inspection Procedures I, DOE/CTA, 1991
Vulnerability Assessment Fundamentals, DOE/CTA, 1992
Sensor System I, DOE/CTA, 1992
Physical Protection Systems, 1993
Root Cause Analysis Workshop, 1994
Performance Based Assessments, 1994
Site Safeguards and Security Planning Workshop, DOE-HQ, 1995

NAME: Barbara M. Reames
AREA OF RESP: DOE Accident Investigation Board Administrator
ASSOCIATION: Manager's Office, U.S. Department of Energy (DOE) Savannah River Operations Office (SR), Aiken, SC
EXPERIENCE: 35 Years

- **U.S. Department of Energy (DOE)**
 - Detailed, Secretary, Manager's Office, SR, Aiken, SC.
 - Division Secretary, Environmental and Laboratory Programs Division, SR.
 - Served as Secretary in Personnel Office, Office of External Affairs, production Division, Safety Division, SR.
 - Detailed Twice, Secretary, DP-6 and DP-60, DOE Headquarters, Forrestal Building, Washington, DC.
 - Detailed, Rocky Flats Resumption Team, Secretary to Assistant Manager for Environment, Safety and Health, DOE Rocky Flats, CO.
- **Richmond County Sheriff's Department, Augusta, GA**
 - Deputy Sheriff/Deputy Jailer Office Manager/Administrative Assistant to Sheriff.
- **Augusta Police Department, Augusta, GA**
 - Office Manager/Executive Secretary to Chief of Police.
 - Collateral Duty as Secretary to Board of Civil Service Commission, Governing Body of Augusta Police and Fire Departments.
- **Johnson Motor Company, Augusta, GA**
 - Office Manager and Head Bookkeeper, Large Auto Dealership.

EDUCATION: Graduate, Academy of Richmond County, Augusta, GA

Courses, University of GA Extension, Augusta, GA

OTHER: Many Courses Secretarial, Administrative, Computer/Systems Administrator, Interpersonal
Federal Women's Program Council Member, SR, Aiken, SC
Federally Employed Women's National Board of Directors,
S.E. Regional Representative, Washington, DC

NAME: Raymond R. Rogers, C.S.E

AREA OF RESP.: DOE Accident Investigation Board Advisor

ASSOCIATION: Office of Occupational Safety and Health Policy, EH-51, Department of Energy, Headquarters

EXPERIENCE: 35 years

- **U.S. Department of Energy**

- Occupational Safety and Health Manager.
- Senior Occupational Safety and Health Expert for DOE-wide Worker and Facility Safety.
- Manager of the DOE Interpretations Guide to OSH Standards.
- Manager of the DOE 800 Response Line.
- Team Member, EM-60 Rocky Flats Pre-Turnover Review.
- Team Member, ES&H Progress Assessment, Idaho National Engineering Laboratory.

- **U.S. Department of Labor, Occupational Safety and Health Administration**

- Occupational Safety and Health Supervisor/Area Director: Responsible for managing eight professionals in the areas of industrial hygiene, industrial and construction safety within the designated boundaries of the area office.
- Senior Safety and Health Compliance Officer: Directly responsible for inspecting a wide variety of complex and high risk industrial activities in diverse workplaces.

- **U.S. Air Force**

- Construction and Utilities Superintendent: Responsible for managing civilian and military professional in areas of contract management for heavy construction and the installation of utility systems at military facilities throughout the United States and overseas.

EDUCATION:

OTHER: Certified Safety Executive, WSO

Certified Civil Engineering Technician

NAME: John D. Simpkins
AREA OF RESP: DOE Accident Investigation Board Adviser
ASSOCIATION: Battelle, Columbus Operations
EXPERIENCE: 25 years

- **Battelle, Human Systems and Performance**

- Twelve years designing, developing and evaluating professional development, training and performance improvement programs for governments and industry.
- DOE, Security Evaluations. Participated in numerous inspections and evaluations of protective force training programs at DOE facilities.
- State of Ohio, Dept of Education. Conducted multi-year statewide studies of the impact of special instructional programs in Ohio schools.
- US Air Force, Tinker Air Force Base. Managed an ergonomic hazard identification/assessment project for nearly 300 different job types.
- DOD, OASD-Health Affairs. Developed training requirements to support the operation of new computer technologies in DOD Health Care facilities.
- DOE/Oak Ridge/IWES. Completed a human factors hazard analysis and training needs for a prototype PCB incinerator operations and maintenance.

- **Prior to Battelle**

- Vanderbilt University Medical Center. Planning and development of training of technology applications and use for health care professionals.
- Ten years teaching and curriculum development at major state universities.

EDUCATION: Ph.D. Communication Systems, Ohio University

OTHER: Post Doctoral Program: Information Science and Systems, School of Medicine, University of Missouri-Columbia
Inspection Process Training, DOE Security Evaluation

NAME: Mark A. Smith

AREA OF RESP.: DOE Accident Investigation Board Advisor

ASSOCIATION: Department of Energy, Savannah River Operations Office

EXPERIENCE: 12 years

- **U.S. Department of Energy, Savannah River Operations Office, Aiken, SC**
 - Nuclear Engineer, Operational Programs Division, Office of Environment, Safety, Health and Quality Programs. Responsible for oversight of laboratory operations involving safety, maintenance, engineering, projects, operational readiness reviews, and conduct of operations. Savannah River Site Operations Assessment Program Manager.
 - Nuclear Engineer, Nuclear Safety Branch, Safety Division, Office of Environment, Safety, Health and Quality Programs. Responsible for technical oversight, review and approval of safety analysis reports, technical safety requirements, unreviewed safety questions, operational readiness reviews, authorization basis documents, nuclear criticality safety analyses, and associated programs.
- **U.S. Department of Defense, Department of the Navy, Charleston Naval Shipyard, Charleston, S.C.**
 - Nuclear Engineer, Fluid Systems and Mechanical Engineering Division, Nuclear Engineering Department. Duties included preparation of technical repair and maintenance procedures and engineering oversight of work operations for Naval Nuclear reactor plant fluid and mechanical systems. Developed extensive program for performing primary side steam generator eddy current inspections and repair.
 - Nuclear Engineer, Test Engineering Division, Nuclear Engineering Department. Duties included preparation of test procedures and the conduct of post-maintenance testing for Naval Nuclear reactor plant systems.

EDUCATION: B.S., Mechanical Engineering, Clemson University

OTHER: Board Member on Type A Accident Investigation of Chlorine Release at Argonne National Laboratory - West on April 15, 1994

Board Member on Type B Accident Investigation of H-Canyon Condensate-Induced Water Hammer Accident at Savannah River Site on June 16, 1994

NAME: David R. Spence (DOE Senior Executive Service - Retired)

AREA OF RESP.: DOE Accident Investigation Board Advisor

ASSOCIATION: Lockheed Idaho Technologies Company (Consultant)

EXPERIENCE: 34 Years

- **RI-Tech. Inc, Aiken**
 - Advisor, DOE Fernald Uranium Nitrate Hexahydrate, Operational Readiness Review.
- **Halliburton-NUS Aiken, SC**
 - Member, Type-B Accident Investigation Board, Condensation Induced Water Hammer Accident.
- **Technical and Professional Services, Fayetteville, TN**
 - Advisor, Type-A Accident Investigation Board, Idaho National Engineering Laboratory Chlorine Release.
 - Member, Oak Ridge Field Verification Team, Chemical Safety Vulnerability Review.
- **U.S. Department of Energy, Savannah River Operations Office, Aiken, SC**
 - Assistant Manager, Engineering and Projects.
 - Member, Type-A Accident Investigation Board, Hanford Steam Fatality.
- **U.S. Department of Energy, Strategic Petroleum Reserve, New Orleans, LA**
 - Assistant Manager, Operations and Maintenance/Engineering and Construction.
 - Tiger Team Leader, Sandia National Laboratories.
 - Manager, Isotope Program, Oak Ridge, TN.
- **U.S. Department of Energy, Oak Ridge, TN**
 - Deputy Manager, Centrifuge Machine Office, Gas Centrifuge Enrichment Plant Project.
 - Director, Product Assurance and Acceptance Division.
 - Member, Baseline Assessment Team, Strategic Petroleum Reserve.

- **Northrop Space Laboratories, Huntsville, AL**
 - Director, System Analysis Division.
 - Director, Operations Analysis, Space System Branch.
- **National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, TX**
 - Aerospace Engineer, Space Science Payload System Integration.
- **The U.S Air Force, Tinker Air Force Base, Oklahoma City, OK**
 - Structures Engineer, Aircraft Accident Investigation.

EDUCATION: B.S., Mechanical Engineering, University of Oklahoma
Graduate Studies in Aerospace Engineering

OTHER: DOE Exceptional Service Award (1994)
DOE Accident Investigation Chairman Workshop (1993)
Fundamentals of DOE Operations (1990)
Japanese Methods for Productivity and Quality (Deming-1982)

NAME: Michael L. Stalcup

AREA OF RESP.: DOE Accident Investigation Board Member

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 24 years

- **U.S. Department of Energy**

- Protection Program Management and Information Security Inspector, Office of Security Evaluations. Plans and conducts safeguards and security oversight activities of DOE facilities.

- **U.S. Army**

- Senior Intelligence Analyst, U.S. Forces Korea. Collection and analysis of data, and reporting of results to senior U.S. and Korean government officials.
- Executive Officer, Military Intelligence Battalion, U.S. Forces Korea. Developed and implemented internal oversight program.
- Intelligence Analyst, Defence Intelligence Agency. Coordinated intelligence support for the Joints Chiefs of Staff.
- Company Commander, U.S. Forces Europe. Responsible for the development and execution of operational plans, training program, and safety program.
- Safety Officer, Air Defense Unit, U.S. Forces Europe. Developed and implemented safety program for geographically dispersed unit.
- Intelligence Training Officer, First U.S. Army. Coordinated training activities for Reserve and National Guard Military Intelligence Units.
- Security Officer, Air Defense Unit, U.S. Forces Korea. Planned and implemented security oversight program for nuclear capable unit.

EDUCATION: B.A. Degree History; University of Wyoming

OTHER: U.S. Army Command and General Staff College (1981)

NAME: Elliott P. Sydnor, Jr. - Colonel, U.S. Army (Ret.)
AREA OF RESP.: DOE Accident Investigation Board Advisor
ASSOCIATION: Inspection & Evaluation Team Member, DOE Directorate of Security Evaluation
EXPERIENCE: 45 years

- **U.S. Army**
 - Special Operations & Tactics.
 - Commandant, U.S. Army Ranger School.
 - Instructor, Airborne Dept., U.S. Army Infantry School.
 - Instructor, Company Tactics, U.S. Army Infantry School.
 - Commander, 1st Special Forces Group (ABN).
 - Lecturer, U.S. Air Force, Special Operations School.
 - U.S. Army Ranger Hall of Fame - 1992.
- **Department of Energy**
 - Inspection & Evaluation Team - Protective Force Area.
- **Private Industry**
 - Operations & Training - WATCO.
 - SRT Lesson Plan Writer - WATCO.

EDUCATION: B.S., Physical Education, Western Kentucky University
M.S., Personnel Management, George Washington University, Washington, D.C.

NAME: John W. Teske

AREA OF RESP.: DOE Accident Investigation Board Member

ASSOCIATION: U.S. Department of Energy, Office of EH Residents

EXPERIENCE: 30 Years Occupational Safety and Health

- **Occupational Safety and Health Program Management**

- U.S. Department of Agriculture.
- Versar Incorporated.
- U.S. Fish and Wildlife Service.
- University of Minnesota.

- **Occupational Safety and Health Compliance and Oversight**

- U.S. Department of Energy.
- Occupational Safety and Health Administration.
- Mining Safety and Health Administration.

- **Accident Investigation Experience**

- Program Manager DOE Accident Investigation Program.
- Type A Investigation 1994, Argonne National Laboratory-West Site.
- Numerous investigations during career.

EDUCATION: B.S. Civil Engineering and Graduate Occupational Safety and Health Studies, University of Minnesota; Master of Business Administration, George Mason University

OTHER: Certified in Comprehensive Practice of Industrial Hygiene; Registered Professional Engineer, California; Certified Safety Professional.
Served on a number of professional association assignments; and instructor or faculty member at Federal training centers, colleges, and universities.

NAME: Dennis L. Vernon

AREA OF RESP.: DOE Accident Investigation Board Member

EXPERIENCE: 24 years

- **U.S. Department of Energy**

- Security Specialist, Office of Security Evaluations. Serves as a member of the Inspection and Evaluation Team that assesses the adequacy and effectiveness of safeguards and security programs across the Department, including the Protective Force Program.
- Chief, Inspections and Technical Assessments Branch, Safeguards and Security Division, Savannah River Operations Office (SR).
- Technical Security Specialist, Security Operations Branch, Safeguards and Security Division, SR.
- Physical Security Specialist, Security Operations Branch, Safeguards and Security Divisions, SR.

- **United Nuclear Corporation**

- Security Supervisor. Provided oversight of protective force training and operations; developed various response force contingency plans to meet U.S. Nuclear Regulatory Commission and DOE requirements; served as a site Emergency Director.

- **U.S. Department of Treasury**

- Federal Officer, Executive Protective Service, U.S. Secret Service. Served in the White House and Foreign Missions Divisions; participated on various executive protection details.

EDUCATION: B.S., Administration of Justice, The American University
A.A.S., Police Science, Northern Virginia Community College

OTHER: Certified Protection Professional (1982)

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APPENDIX C

**MEDICAL RECORDS RELATED
TO THE ACCIDENT**

APPENDIX D

**OCCURRENCE REPORTS FOR SIMILAR RAPPELLING
INCIDENTS - DOE COMPLEX WIDE**

APPENDIX D

OCCURRENCE REPORTS FOR SIMILAR RAPPELLING INCIDENTS DOE COMPLEX WIDE

<u>CASE NUMBER</u>	<u>DESCRIPTION</u>
84001	An employee was participating in wall rappel training and he experienced pain in the groin area. The employee was sent to medical and was diagnosed as having a strained groin muscle.
84010	During a rappelling drill for a hillside rescue, an employee pushed off from the side of the hill and dropped about two feet. Due to the steepness and unevenness of the hillside and the semi-rapid movement down the face of the hill, all of his body weight may have been on his right leg for a fraction of a second when he landed, and he was unable to push off the hillside again due to a sprain or strain in his right leg.
84013	While participating in a rappelling exercise, the employee's feet slipped as he was stepping over the edge of the rappelling wall and he fell a short distance and hit his back against the wall.
84015	While participating in a rappelling exercise, an employee proceeded to the edge of a cliff to get out of the rain when he stepped on a slick rock and twisted his right ankle.
84016	While training on ropes, an employee slipped over the edge of the drill tower and scraped and bruised his left elbow.
84017	An employee was rappelling during a drill and strained his left hip muscle.
85010	An employee was participating in a rappelling exercise using the "Australian" technique when his knee gave way. The employee was belayed to the ground, and an ice pack was applied to the knee. An examination later revealed he had sustained torn and stretched ligaments and slight cartilage damage, which required surgery to repair.
85017	While involved in a rappelling training exercise, an employee pushed off the wall and twisted his left ankle upon making contact with the wall.
85031	An employee was rappelling down the side of a building when he dislocated his left knee. It was determined that the rappelling activity aggravated a pre-existing non-occupational injury.
85038	An employee was participating in rappelling practice, and while in "free fall" from the three-story drop, his right foot struck a window sill. The employee sustained multiple fractures of the right foot, and possible back strain.
86001	During a training exercise, an employee was demonstrating a rappelling technique and as he was talking, he failed to properly connect his equipment and he fell from the rappel tower. He was admitted to the hospital, where it was determined that he had sustained a cracked vertebra, compressed discs, and minor internal bleeding.
86008	An employee was participating in helicopter rappel training when he lost control of his descent approximately 15-feet above the ground. The employee landed on the ground with his feet separated, fracturing his right ankle.

CASE NUMBER**DESCRIPTION**

- 86012 An employee was participating in rappel training when he lost control of his descent. The employee stuck out his right leg to grab hold of a pipe which ran along the wall of the building to slow his descent, but he continued to descend faster than normal and landed on a cement surface feet first. The employee was taken to medical and treated for a contusion. Additional tests later revealed increased compartment pressure, and surgery was required on his leg to relieve the pressure.
- 86116 During a training exercise, an employee was rappelling down the outside of the firehouse hose tower when his right elbow struck the masonry wall resulting in a laceration to his right elbow.
- 87035 An employee was participating in a rappel training exercise when he suffered first and second degree friction rope burns to both hands on the palmer side. The employee was not wearing the required gloves for this rappel exercise as instructed.
- 88004 During SRT qualifications, an employee was doing a "spider drop" from the second story roof. The employee neglected to remove his wedding ring from his finger before participating in the exercise, and the weight of his body caused the ring to cut into his finger. The cut required five sutures to close.
- 89001 As an employee was rappelling from a building during a training exercise, his rifle swung around and hit his chin with the rifle scope. He sustained a cut that required six sutures to close.
- 89017 An employee was rappelling down a practice tower and impacted the ground at an angle that caused him to sustain a fracture to the right ankle.
- 89020 An employee noticed pain in his back after participating in a rappelling exercise. Employee sustained back strain.
- 90001 During helicopter fast-rope training, the first employee to rappel down did not get off the rope quickly enough, and was struck in the head by the next person's feet and the rope. The injured employee was taken to the hospital for observation after complaining of headache, nausea and vomiting as a result of being struck on the head.
- 90022 An employee was rappelling at the live-fire range for security training. While rappelling down the rappel tower, the employee's shirt pulled tight in the underarm area and pinched a mole, which promptly filled with blood. Treatment resulted in the employee requiring two sutures.
- 90023 An employee was rappelling down a four-story rappel tower when his legs slipped and he lost control of his descent. His right shoulder struck the side of the tower resulting in a trapezius strain.
- 90025 An employee was rappelling down a tower as part of required training when he lost control of his descent and as his hand collided with the tower wall. The employee reported to medical and was treated for a right hand contusion.
- 90053 An employee was rappelling from a tower and as he was descending he entered a window. After leaving the window, the employee swung back to the wall, his foot slipped and a knee impacted the wall. The knee became swollen due to fluid collecting.

CASE NUMBER**DESCRIPTION**

- 91009 An employee was fast roping down the rappel tower during tactical training. The employee was not familiar with the landing conditions, which was uneven piles of gravel, and he came down the tower too fast to have a stable or controlled landing. He hit a pile of gravel, causing him to make a forward landing and he sustained a strain to the muscles and tendons in both ankles and shins.
- 91013 An employee was performing a 50-ft. helicopter rappel and was approximately 20" from the ground when he lost control of his brake hand. The constant motion of the helicopter made it difficult to keep the belay man properly placed, and he was not able to stop the rappeller's descent. The rappeller hit the ground and sustained a sprained right ankle.
- 91015 Utilizing the fast-rope method, an employee was rappelling from a training tower and he failed to brake his descent because he had his hands improperly positioned on the rope. The employee then landed with his feet approximately 18-inches apart, instead of having his feet together, and he sustained a fractured right leg.
- 91132 An employee was participating in rappel training and reported that he felt very hot. The employee was diagnosed at a health center as having mild heat exhaustion due to the stress requirements of the rappelling operation.
- 92009 An employee (SI) was participating in Helicopter Rappel Proficiency training when a second employee came down and swung in on the other side of the helicopter and his feet struck the SI in the head. The SI remained conscious and came down the rope on his own, and was then transported to the hospital for observation. The injured employee suffered small cuts on his head, and a sore neck and upper back.
- 93014 An employee was participating in helicopter rappel training from an altitude of approximately 40-feet, and while attempting to brake his descent, he lost the rope from his brake hand and visual contact with the ground. The employee fell, landed on his feet and fell backward. The employee was taken by ambulance to the hospital where he was diagnosed with a dislocated fracture of the left ankle and a fracture of the left tibia, which required surgery to repair.
- 93047 An employee was rappelling from a helicopter from approximately 40-feet above the ground, and while descending he experienced pain in his right arm and shoulder. At the hospital, it was determined that the employee had sustained torn ligaments to the right shoulder.
- 93054 An employee was participating in a Tactical Proficiency Evaluation and was carrying an additional 50-pounds of gear. As he pulled himself into a window off the caving ladder, he experienced pain in the lower middle portion of his back, and when he rappelled off the rappel tower, he felt the pain intensify.
- 94004 An employee was injured while participating in an "Australian" rappelling exercise. As the rappeller approached the edge of the structure, his legs appeared to twist and fail to move. The rappeller was lowered to safety and then transported to a hospital where he underwent surgery for torn ligaments in his right knee.

CASE NUMBER

DESCRIPTION

- 94013 During a training exercise, an employee rappelled from a helicopter and was then unable to disengage from the rappel rope. The aircraft began to ascend and move toward a fence with the employee being towed. The employee struck the fence, was pulled over the top, and fell to the ground outside of the fence. The employee was taken to the hospital, examined and released that same evening.
- 94059 An employee was participating in rappel training from the top of a 40-foot building. He had completed his hook-up and had been checked, and as he was making his descent he lost control of the rope. A co-worker on belay noticed that the employee was falling and immediately tightened the rope to stop his fall. The rappeller stopped falling approximately 2-feet above the ground, but he had extended his arm down to stop his fall, and a bone in his right arm was fractured upon impact.

APPENDIX E

EMERGENCY RESPONSE CHRONOLOGY

APPENDIX F

ROPE CONSTRUCTION AND APPLICATION

APPENDIX F

ROPE CONSTRUCTION AND APPLICATION

Laid Rope

Most rappel ropes are constructed using nylon fibers. The fibers are twisted into yarn. To keep the fibers from untwisting, two or more yarns are twisted together, generally in a clockwise direction. If a stronger rope is needed, several strands are twisted together in a counterclockwise direction to make the rope. This is a standard rope manufacturing process, which is illustrated in Figure F-1 and is called "right-laid." For making left-laid rope, the process is reversed.

The angle of the spiraling in the yarn and strands determines many characteristics of laid rope, such as strength, elongation, spliceability, and stiffness. The greater number of spirals per inch, the weaker the rope and the greater its stretch. In other words, straight fibers offer maximum strength and minimum stretch. However, in order for most ropes to be elastic enough to be safe, fibers must be spiraled.

Very tight spiraling is called "hard lay" and causes the rope to be very stiff, yet very elastic. "Soft lay" ropes have the opposite characteristics. Most rappel ropes are of the "hard lay" type so that they can absorb sudden loads generated during the rappel. The tightly twisted ropes also resist the effects of dirt and abrasion better than "soft lay."

Although laid rope can be used for rappelling, there are three negative factors in its use. One is the fact that it is of twisted construction; therefore, it tends to untwist as you rappel. Second and most dangerous is their great amount of stretch. Most will stretch 8 to 12 percent from the weight of the average rappeller. Third is the loud clicking noise they make when used with most descenders, which could be a problem during certain tactical missions. On the positive side, laid ropes are strong and reliable, and their dynamic, rubberband effects make them less apt to pull out anchors, or break under sudden heavy loads.

Braided or Plaited Rope

Instead of being twisted, yarns can also be braided or plaited. Both types exhibit less stretch than laid ropes. They also have a greater strength for a given diameter and are less likely to twist or kink. However, because these ropes are softer than "hard lay" ropes, they tend to lose strength faster during use.

The finest construction available for rappel rope is called "kernmantel." It consists of a core of fibers covered by a braided fiber sheath. The prime purpose of the sheath (mantel) is to protect the fibers of the core (kern) from dirt and abrasion, thus increasing the life of the rope.

Kernmantel ropes are used for rappelling at the Department of Energy Central Training Academy in Albuquerque, New Mexico, and are recommended because of their superior higher safety factor for a given rope diameter and their greater resistance to wear.

APPENDIX G

**TYPE C ACCIDENT INVESTIGATION
REPORT OF THE TRAINING INCIDENT
ON FEBRUARY 24, 1994**

APPENDIX H

DOCUMENTS REVIEWED

APPENDIX H

DOCUMENTS REVIEWED

DOE Orders

1. DOE 4330.4A, Maintenance Management Program
2. DOE 5480.4, Environmental, Safety and Health Protection
3. DOE 5482.1, Environmental, Safety, and Health Appraisal Program
4. DOE 5484.19, Conduct of Operations Requirements for DOE Facilities
5. DOE 5484.4, Environmental Protection, Safety and Health Protection
6. DOE 5500.1B, Emergency Management System
7. DOE 5500.3B, Planning and Preparedness for Operational Emergencies
8. DOE 5630.15, Safeguards and Security Training
9. DOE 5632.7A, Protective Force Program
10. DOE 5634.1B, Facility Approvals, Security Surveys, and Nuclear Material Survey

DOE Savannah River Office

11. Savannah River Operations Office Management and Operating Contract for Paramilitary Security Services, Contract Number DE-AC09-93-SR18292, Effective Date September 30, 1993
12. Unannounced Occupational Safety and Health Administration (OSHA) Compliance Inspection No. 94-SD-ISB-0022, June 3, 1994
13. DOE Letter, L. Brown (SR)\L. Brede (WSI), Dated December 20, 1994, Subject: "Authorization to Carry Weapons Off-Site During Calendar Year 1995"
14. WSI-SRS Monthly Maintenance Report, March 20, 1995
15. Maintenance Request, May 13, 1994
16. SRM 1100.6.X.X.1, Organizations, Functions, and Delegations
17. Performance Evaluation Plan for Wackenhut Services, Incorporated, Contract No. DE-AC09-93SR-18292
18. Savannah River Operations Office Contract Plus Award Fee Determinations for Wackenhut Services, Incorporated

19. SRIP 5480.19.1C, Facility Representative Program
20. SRIP 5700.6.12A, SR Technical Assessment Program
21. SR OSS 5482.1.1A, Performing Safeguards and Security Appraisals
22. SR DII 5632.7B, Protective Force Program

Wackenhut Services, Incorporated - Savannah River Site Documents

23. Transmittal of Requested Information - ATTA Range Accident (SRT Statements), April 6, 1995
24. Memorandums of Understanding, Westinghouse Savannah River Company and Wackenhut Services, Incorporated, July 1994
25. WSI-SRS Memorandum: C. Futch/R. Evitts, Dated May 21, 1991, Subject: "Approval to Use Single Rope Rappel for 1991 National SWAT Competition"
26. Security Police Officer III Training Lesson Plan
27. Live Fire Obstacle Course Lesson Plan #93.30.06
28. Tactical Proficiency Evaluation Lesson Plan #93.30.19
29. Helicopter Rappelling Lesson Plan #93.30.28
30. Purchase Order 29291, 11/01/94, Mountain Climbing Rope, 120' Coil
31. WSI-SRS Standard Procedures
 - a. 1-01, "Functions and Responsibilities Directive (FARD)"
 - b. 1-1002, "Maintenance Management Responsibilities"
 - c. 1-3100, "General Safety Procedures"
 - d. 1-3105, "Inspection Programs"
 - e. 1-3112, "Line Control Safety and Health Program"
 - f. 1-3144, "Accident/Injury Review and Investigation"
 - g. 1-3151, "Guidelines For ES&H Representatives Program"
 - h. 1-3157, "Job Safety Analysis"
 - i. 1-3301, "Self-Inspection Program (SIP)"
 - j. 1-3304, "Management/Safety Oversight Walkdown"

- k. 1-3307, "Environment, Safety & Health and Quality Department Audit, Appraisal and Surveillance Program"
- l. 1-3309, "Quality Assurance Surveillances"
- m. 1-5600, "Rappelling," Rev. 2
- n. 1-6902, "SATA and ATTA Preaccident Plan"
- o. 1-6904, "SATA and ATTA Range Operations and Safety Procedure"
- p. 1-6912, "Occupational Safety and Health (OSH) Inspections of SATA and ATTA"
- q. 1-8100, "Facility/Equipment Repairs"
- r. 1-8102, "Operational Readiness Review (ORR) Procedure"
- s. 2-301, "Standardized Muster Checklist"
- t. 2-305, "On The Job Training Program"
- u. 2-321, "Tactical Proficiency Evaluation"
- v. 3-5601, "SRT Static Display and/Training Demonstration"
- w. 3-5617, "WSI-SRT National SWAT Competition Selection Process"
- x. 3-6006, "Incorporation of Lessons Learned Into Training Program"
- y. 3-6601, "Rappel Training for SRT"
- z. 3-6900, "Range Safety Officer Responsibilities"

Westinghouse Savannah River Corporation Documents

- 32. WSRC 2Q2 Manual
- 33. Memorandums of Understanding, Westinghouse Savannah River Company and Wackenhut Services, Incorporated, July 1994
- 34. Facility Evaluation Board Report - B-Area Facilities (U), ESH-FEB-95-0515, March 8, 1995
- 35. Procurement SSD-CWE-943148, August 18, 1994 (Rappel Tower Safety Rails and Repair)
- 36. An Evaluation of Rappelling Rope Capacity and Loading, WSRC-TR-95-1094

Occupational Safety and Health Administration Documents

- 37. Code of Federal Regulations 29 CFR 1910.23, Guarding Wall and Floor Openings and Holes

38. Code of Federal Regulations 29 CFR 1926.500, Guardrails, Handrails and Covers

Central Training Academy Document

39. CTA Rappel Instructor Course and Lessons Plan

Other Documents

40. Martin, Tom, Rappelling, Edition II, Search, Mt. Sterling, KY, 1988
41. Military Mountaineering, Training Circular 90-6-1, Dated April 1989, Published by the U.S. Department of the Army, Washington, D.C.
42. Ranger Handbook, Study Text 21-75-2, Dated October 1980, Published by the U.S. Department of the Army Infantry School
43. Special Tactical Training for the Response Force, Tactical Training Manual 1-III, DOE/DP/30319-3, Dated 1985, Prepared by Criterion Referenced Consultants, Incorporated, Under Contract Number DE-AC01-83DP30319 and Published by the U.S. Department of Energy, Office of Safeguards and Security
44. Guide for Implementation of Safeguards and Security Directives, Chapter III, Dated March 10, 1995, Published by the U.S. Department of Energy, Office of Safeguards and Security on March 17, 1995
45. 2nd Annual SWAT Competition Announcement, Spartanburg County Detention Facility, Spartanburg, SC, April 13 - 15, 1995.
46. DOE Emergency Management Guide, June 26, 1992

APPENDIX I

INDIVIDUALS INTERVIEWED

APPENDIX I

INDIVIDUALS INTERVIEWED

Name	Position	Organization
Borchardt, Fredrick J.	Senior Tactical Instructor	DOE Central Training Academy, Albuquerque
Bowling, Larry	Range Manager	Wackenhut Services, Inc.
Brede, Jr., Lawrence	Sr. Vice President and General Manager	Wackenhut Services, Inc.
Brooks, Lee G.	Director	Wackenhut Services, Inc., Training Division
Brown, George	President	Brown Welding Company
Brown, James	Director	Wackenhut Services, Inc., Environment, Safety, and Health
Brown, Sr., Larry	Deputy Director	DOE-SR, Security Management Division
Burge, Robert A.	Industrial Security Specialist	DOE-SR, Office Safeguards and Security
Carney, Ritchie	Manager	DOE Headquarters, Office of Safeguards and Security
Cooksey, Tommy	Sergeant	Wackenhut Services, Inc., Special Response Team (SRT) Training Division
Crouch, William S.	Emergency Medical Technician	Wackenhut Services, Inc., SRT
Davis, Robert L.	Range Safety Officer and Firearms and Instructor	Wackenhut Services, Inc., Training Division
Dawson, Greg	Safety Chairman	Wackenhut Services, Inc.
Drury, David	Industrial Safety Engineer	DOE-SR, Office of Safety
Evitts, Rex	Commander	Wackenhut Services, Inc., SRT
Frischmann, William M.	Lieutenant	Wackenhut Services, Inc., SRT
Gann, William	SPO-3	Wackenhut Services, Inc., SRT
Godbee, Dennis	Senior EH Resident	DOE Headquarters (EH-24)
Greene, Jeffrey Guy	Special OPS Training Instructor	Wackenhut Services, Inc.

Name	Position	Organization
Hall, Kevin	Acting Eastern Regional Manager	DOE Headquarters (EH)
Harrison, Don W.	Deputy Manager	Central Service of Works Engineering
Hendricks, William D.	Manager	Wackenhut Services, Inc., Special Operations Training
Hudson, Todd	SPO-3	Wackenhut Services, Inc., SRT
Luther, Archie	SPO-3	Wackenhut Services, Inc., SRT
McCoy, III, Frank R.	Assistant Manager	DOE-SR, Environment, Safety, Health and Quality
Mitchell, Ronald W.	SPO-3	Wackenhut Services, Inc., SRT
Moore, Bobby	SPO-3	Wackenhut Services, Inc., SRT
Ogletree, Larry	Director	DOE-SR, Office of Safeguards and Security
O'Neil, Larry	Senior Instructor	Wackenhut Services, Inc., Special Operations Training Division
Pollock, Angie	Section Secretary	Wackenhut Services, Inc., SRT
Powers, Larry	Director	Spartanburg Co. Detention Facility
Reynolds, Thomas E.	Deputy Director	DOE-SR, Office of Procurement and Contractor of Human Resources
Rosier, H. Therese	Manager	Westinghouse Savannah River Company, B-Area Administrative Facilities Management Department
Shelt, T. Steven	Team Leader	DOE-SR, Office of Safeguards and Security, Security Management Division
Smith, Walter	SPO-3	Wackenhut Services, Inc., SRT
Spears, J. Terrel	Deputy Director	DOE-SR, Quality Programs Division
Tussey, Ernest H.	Director	Wackenhut Services, Inc., Special Operations Division
Underwood, Mack	Chief Investigator	Wackenhut Services, Inc.
Vest, Gary	Industrial Security Specialist	DOE-SR, Office of Safeguards and Security

Name	Position	Organization
<p><u>Panel Discussion:</u> Mark Barnwell Kevin "Spike" Gregory Jeffrey "Bones" Hammonds James Reid Jack Sellnet Billy Thornton Jerry Zaun</p>	<p>SRT Members</p>	<p>Wackenhut Services, Inc.</p>
<p><u>EMT Group Interview:</u> James O. Hightower, M.D. Chris Alverson Johnny L. Simmons Michael "Kevin" Faircloth William Robinson, Jr. Greg Brooks</p>	<p>Manager Fire Captain Shift Lieutenant Fire Fighter, EMS Driver Station Lieutenant Registered Paramedic</p>	<p>Westinghouse Savannah River Corporation, Medical Dept. SR Fire Department SR Fire Department SR Fire Department SR Fire Department SR Fire Department</p>
<p><u>SRT Group 1</u> Chris Allen Garland M. Slater, Jr. Dereck Gillespie Jeffrey Stroda Britt Burbury David Sewis Walter Smith Clay Still Wesley Earhart Harold Carter Bennie Efird Ron Mitchell Jerry Brown Levin Gregory Billy Thornton Doug Oglesby Greg Dawson</p>	<p>SRT Members</p>	<p>Wackenhut Services, Inc.</p>

Name	Position	Organization
<u>SRT Group 2</u> Clay Bryant Mark Moon Archie Luther Frank Seaman Travis Fulmer Greg Rowland Karl Summers Eric Frails Rock Slaughter Stan Crouch Charles Ashe Patrick Murphy Shirley Frye Jeff Langley	SRT Members	Wackenhut Services, Inc.

APPENDIX J

**AN EVALUATION OF RAPPELLING ROPE CAPACITY
AND LOADING (U), WSRC-TR-94-0194,
REV. 0, DATED APRIL 26, 1995**

APPENDIX K

WSI-SRS RAPPEL MASTER CHECKLIST

APPENDIX L

**WSI-SRS STANDARD PROCEDURE 1-5600,
RAPPELLING, REV. 2**

APPENDIX M

**SRS FINAL ACCEPTANCE INSPECTION OF
NEW OR ALTERED FACILITIES OR EQUIPMENT**

APPENDIX N

**RANGE SAFETY OFFICER MONTHLY
OSH INSPECTION CHECKLIST**

APPENDIX O

INTEGRATED ACCIDENT EVENT SEQUENCE

APPENDIX P

**WSI-SRS RAPPEL MASTER
TRAINING OUTLINE**

APPENDIX Q

**DOE-HQ MEMORANDUMS SUSPENSION OF
RAPPELLING, DATED APRIL 7 AND 10, 1995**

APPENDIX R

PRESS RELEASE

APPENDIX R

PRESS RELEASE

Aiken Standard, Aiken, South Carolina

Date: 4-8-95