

Contaminated Puncture Wound During TRU Drum Remediation

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Contaminated Puncture Wound Injury

- **Contaminated Puncture Wound**

- 6/14/2010 after performing can puncture operations during TRU remediation activities a worker was placing an indicating device into a can and received a puncture wound to the base of the right index finger.



Contaminated Puncture Wound Injury

- **Contaminated Puncture Wound**
 - Unauthorized use of indicating device resulted in the introduction of a new hazard which ultimately caused the wound



Event Response – Project Management

- **Event received thorough investigation:**
 - SRNS Root Cause Analysis
 - SRNS Independent Investigation Team
 - Fluor Corporate Oversight Review of the SRNS Response
 - DOE-SR Type B Investigation Board
- **Robust corrective action plan:**
 - 103 Corrective actions tracked and completed in NTS
 - Corrective actions for pre-start completed with DOE-SR concurrence
 - Operations resumed on 10/4/10 with Senior Supervisory oversight to ensure:
 - *Worker understanding of the hazards*
 - *Procedural adequacy*
 - *Procedure compliance*
- **Discipline sustainability plan initiated to maintain performance**
- **New leadership with significant Pu handling experience**
- **Critical assessments / worker involvement in change**

Event Response - Radiological Protection

Primary Objective:

“Minimize the Risk and Impact to the Worker”

Elements of Response:

- **Immediate response to the event in the work location**
- **Medical response and treatment**
- **Radioactive material removal**
- **Monitoring of removal efficiency**
- **Engagement of individual and family**

Enforcement Process Timeline

- 6/14/10 - Puncture wound event occurred, NTS report submitted 7/1/2010
- 7/28/10 - Type B Accident Investigation Board established to investigate event
- 8/11/10 - Initial conference call held with the Office of Enforcement and Oversight (OEO) investigators
- 9/27/10 - Letter from The OEO on intent to investigate – initiated cost segregation
- 9/30/10 - Document Request received from OEO on 9/30/10, documents provided 10/18/10
- 10/21/10 - SRNS approached OEO concerning the Consent Order option, OEO denied on 11/3/10 based on dose numbers and progress on reviewing documents
- 12/16/10 - At the OEO's request a conference call rather than on-site investigation was conducted
- 3/17/2011 - The OEO issued the Contaminated Puncture Wound Investigation Report for SRNS review
- 4/19/2011 - An Enforcement Conference was conducted at SRS with the OEO and DOE-SR
- 7/22/2011 – OEO issued PNOV NEA-2011-02 for the Contaminated Puncture Wound event
- Approximately 1 year from occurrence to receipt of the PNOV

PNOV – NEA-2011-02

- **PNOV issued 7/22/2011**
- **Four cited severity level II violations**
 - **Occupational dose limit exceeded** - worker receive > 5 Rem whole body and 50 Rem to surface of tissue
 - **Inadequate Written Procedures** – AHA did not address hazard associated with the survey flag use and procedure did not address the flag use.
 - **Inadequate Training and Qualification** – only informal, undocumented training on flag insertion. Not reviewed with everyone.
 - **Inadequate Quality Improvement** – Management oversight of the process did not detect or correct the problem.
- **25% mitigation was applied to three of the level II violations**
- **Total civil penalty of \$300K mitigated to \$243,750 (also received fee reduction of \$2.8 mil. which included this event and other performance issues)**

Lessons Learned – Project Management

- **Operating team became complacent handling sharps**
- **Operational focus did not sufficiently escalate with increased Pu-238 hazard**
 - Management Oversight
 - Training
 - Procedures
- **Training and management oversight did not fully consider implications of temporary workforce**

Lessons Learned – Radiological Protection

- **Preparation and planning is critical to effective response**
 - REAC/TS Training
 - RPD & Medical training
- **Analytical techniques to provide expeditious results**
 - LSC to screen bioassay samples
 - Rapid Analysis to support Chelation therapy recommendations
- **Development and extension of worker trust and case management**
- **Interface and information exchange with contractor management, DOE, DNFSB needs to be consistent and based on data, not speculation**

Lessons Learned – Enforcement Process

- **Determine the applicability of a Consent Order ASAP**
 - More definitive criteria would help
 - Must be mutually beneficial – the longer you wait the less benefit to OE
 - Consent Order may not be best approach
- **Conference Call verses On-site visit**
 - Considerable savings in unallowable costs
- **Work closely with your field office – stay on the same page**
- **Work closely with management team, share experience in approach, get outside expert to corroborate information**
- **Noncompliance table works well**
 - Noncompliance/causes/corrective actions/effectiveness
 - Helps to ensure that appropriate corrective actions are prescribed and that they will effectively address the noncompliances/causes

Lessons Learned – Example Noncompliance Table

No.	WSH Requirement	Noncompliance(s)	Cause(s)	Action(s) to Prevent Recurrence	Correlation of Electrical Requirements
1	<p>10CFR851.23(G), Safety and health standards/29CFR1910 [“Occupational Safety and Health Standards, excluding 29CFR1910, 1096, Ionizing Radiation”].</p> <p>29CFR1910.132(a) Personal Protective Equipment -General requirements. “Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.”</p>	<p>There is a noncompliance with this requirement because the injured E&I mechanic was not wearing the appropriate Personal Protective Equipment (PPE) for the cited task.</p>	<p>The FLM and Workers willfully violated the requirements of 18Q-2.</p> <p>See <u>10CFR851.20(b)(1)</u> for additional Causes and Actions.</p>	<p>Personnel issues in D Area will be addressed in accordance with the SRNS Employee Development and Disciplinary Program. The QEW status has been revoked for the staff augmentation personnel involved in the incident. (CA #23)</p>	<p>Same issue as No. 3, 7, 8, 9 and 10.</p> <p>Both OSHA and NFPA 70E requirements are cited.</p>