Appendix C

Concerns, Findings, Recommendations, Suggestions And Strengths

FINDINGS

1. *DOE-RL does not provide criticality safety related performance measures to the contractor as required by the FRAM.*
2. *DOE-RL does not regularly review criticality safety analyses as required by the FRAM.*
3. *DOE-RL does not maintain knowledge of the resource requirements needed for the PFP NCS program as required by DOE Policy.*
4. *FDH considers implementation of criticality safety to be the responsibility of the subcontractors, and accordingly provides little oversight in this area.*
5. *The Team found that FDH does not have a mechanism to assure that adequate funding is provided for NCS programs.*
6. *The FDH Nuclear Safety organization does not have sufficient resources to staff an effective NCS program*
7. *The Team found that FDH has issued no Hanford wide NCS policy document that is binding for subcontractors.*
8. *FDH does not define comprehensive responsibilities for the criticality safety engineer according to ANSI / ANS-8.19 in HNF-PRO-334.*
9. *FDH does not have a plan to ensure that qualified criticality safety staff from FDNW or outside subcontractors is familiar with PFP and will be available to BWHC.*
10. *FDH does not perform trending of criticality safety infractions and criticality safety related events.*
11. *FDH does not monitor the criticality safety program with sufficient frequency or depth to assure criticality safety.*
12. *FDH does not perform self-assessments with sufficient emphasis on the criticality safety program to evaluate the program's effectiveness.*
13. *FDH does not require CSEs supporting PFP to be familiar with the facility or operations.*
14. *FDH and BWHC do not have programs to train CSEs to familiarize them with operations and the facility.*
15. *The FDNW qualification program for criticality safety engineers is not sufficiently rigorous to assure development of necessary criticality safety expertise.*
16. *FDNW CSEs assigned to PFP are not familiar with operations or the facility.*
17. *The methodology for identifying scenarios identified as contingencies non-conservatively credits controls and may cause infractions to be categorized incorrectly. FDNW does not differentiate controlled parameters and contingencies.*
18. *BWHC has not issued a PFP criticality safety policy.*
19. *The responsibilities of the criticality safety engineer are not defined by BWHC Management.*
20. *BWHC accepts CSERs from FDNW at face value and does not perform an independent technical review of CSERs prior to authorizing operations as required by ANSI/ANS-8.19.*

RECOMMENDATIONS

1. *DOE-RL should define roles for and utilize additional criticality safety specialists to provide continuous feedback on the implementation of criticality safety programs. Additionally, DOE-RL should establish a clear focus for criticality safety within the organization with defined roles responsibilities and contractor interfaces. DOE-RL should provide programmatic direction to the subcontractors through the IMC while performing direct oversight of the subcontractors.*

2. *DOE-RL establish criticality safety performance measures with FDH. Criticality safety performance measures should be considered for:*
   - closing infractions in a timely manner;
   - avoiding repeat infractions;
   - time spent by the CSE on the floor in the process areas;
   - reducing discrepancies between CSERs, CPSs and postings;
   - encourage self reporting by Operations, minimizing infractions discovered by oversight groups
   - formal training and qualification of the CSEs and CSRs; and,
   - attendance of the criticality staff at professional technical conferences.

   Criticality safety performances measures should not:
   - incentivize or penalize award fee to induce the contractor to have zero infractions, or
   - involve time or cost of producing CSER.

3. *In the absence of effective criticality safety programs at DOE-RL and FDH, consideration should be given to extending the exclusivity clause for FDNW because, even with the above programmatic deficiencies noted, several members of the FDNW criticality safety staff have Hanford and PFP experience and the demonstrated technical ability to provide support to PFP. DOE-RL, FDH, and BWHC should form a partnership to ensure that FDNW provides the best CSE support available to PFP in the near term until specific guidance is developed by FDH to provide necessary NCS technical support in the longer term. Alternatively, BWHC could retain its own CSE staff as permanent employees or FDH could assume the NCS role for the site and matrix CSE to the facilities as needed. While the first of these three options fits best with the current IMC arrangements, the third has the best chance of providing a vigorous NCS program for Hanford.*

4. *FDH should formally strengthen the oversight and assessment role of Nuclear Safety. FDH Nuclear Safety should review CSERs, CPSs, postings, infractions, corrective action plans, etc. to ensure that the PFP NCS program is implemented and advise FDH Project Direction as appropriate.*

5. *FDH Nuclear Safety should remain knowledgeable of the funding needs of the BWHC NCS program and should provide FDH Project Direction with reports and recommendations on required funding levels.*

6. *FDH should issue Hanford wide NCS policy and develop contract mechanisms to ensure that FDH NCS policies and procedures are binding upon all subcontractors.*

7. *The Team recommends that FDH management should provide additional resources to Nuclear Safety in the form of two qualified criticality safety engineers familiar with facility operations. Furthermore, FDH Nuclear Safety monitoring and trending for the Criticality Safety Program should be increased to include non-reportable criticality safety occurrences and related events so that appropriate corrective actions may be initiated.*

20. *A BWHC Procedure Change Board should be considered to improve the quality of the procedure changes and minimize the impact on training of operators.*
21. *Line supervision should review and approve CSERs for operations under their control.*
22. *Some of the NCS responsibilities currently assigned to the CSR should be transferred to the FDNW CSE supporting PFP. Among these responsibilities are reviewing operating procedures and postings, process and equipment modifications, assisting with NCS training, performing regular audits, and evaluating infractions and developing corrective actions.*
23. *Criticality safety postings should incorporate good human factors practices. Procedures for developing postings have been implemented at Rocky Flats, Y-12, and BWX (formerly Naval Nuclear Fuels Division [NNFD]). The CSE should approve the postings to ensure that all limits and controls are correctly represented.*
24. *Better document control practices (e.g. marking drafts as "Draft") should be implemented to identify draft CSER documents.*
25. *The independent CSER assessment checklist should include a requirement to assess the hierarchy of NCS controls according to ANSI/ANS-8 standards. Justification for selection of administrative controls instead of engineered controls should be required.*
26. *Qualitative fault trees should be developed during the CSLEP program. This can serve to proof test the older CSERs for adequate coverage of contingencies and then would be useful in evaluating incidents for infraction reporting. The CSLEP program should be carried out with a CSE familiar with PFP operations.*
27. *Material flow charts and sketches of normal and non-normal fissile material configurations should be incorporated into the CSERs.*

STRENGTHS

1. *The thorough knowledge of operations and the technical ability of the incumbent CSR is the outstanding feature of the BWHC NCS Program.*
2. *The HFD and PFP have a fire safety program, including procedures[27] that impact on PFP in a direct and positive manner.*
3. *The availability of operating procedures and the room placards with fire suppression codes from the pre-fire plan are program strengths.*
4. *BWHC management demonstrates responsibility for criticality safety at PFP.*

Appendix D

Technical Review Forms

Fluor Daniel Hanford, Inc.

Nuclear Safety

P.O. Box 1000 MSIN: A3-02

Richland, WA 99352-1000

Fax: (509) 372-8017

Date: 4-10-98

To: JERRY McKAMY

Fax Number: 301-903-6383

Phone Number: _____

From: EMIL KREJCI

Phone Number: 509-376-6887

3 Pages Including Coversheet

If you have trouble receiving this fax, please call Sherri Thackham on (509) 376-8940

Comments:

PARTIAL RESPONSE TO HANFORD

PFP CRIT PGM REVIEW

PLUTONIUM FINISHING PLANT
MSIN T5-50

B&W Hanford Company
P.O. Box 1200
Richland, WA 99352

FAX COVER SHEET

To: GYPSY TWEED
Company Name: PFP - BWHC
Phone: (301) 903-1743 Fax: (301) 903-6383

From: FRED CRAWFORD
Phone: (509) 372-8138 Fax: (509)
Pages: (Including Cover) 27 Date:
If You Do Not Receive All Pages, Please Call 1-509-373-2720

Comments:

Gypsy

Hope this reaches you all right
We had thought this data went to you
beginning of last week. I believe this is all of PFP's
actions, but don't have a summary listing. Please let
us know if there is something missing.

Fred Crawford

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities — Form No. MR-01
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities — Date: 03/31/98
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

1. Identification Section:

A. Observation (including Overall Significance and basis):

Fluor Daniel Northwest does not have sufficient funding from Fluor Daniel Hanford to provide professional development activities for the criticality safety engineers. Attendance at ANS meetings and the LANL/LACEF is restricted, to one or two staff members at ANS meetings and not all staff has attended the LANL/LACEF Criticality Safety Course. Maintaining familiarity with standards, codes, guides and techniques is required by ANSI/ANS-8.19.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy — Date: 03/31/98

Approved Jerry McKamy — Date: 03/31/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities — Form No. MR-01
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities — Date: 03/31/98
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

3. Contractor Response (Provide basis and reference):

This is not appropriate under the Project Hanford Management Contract (PHMC) structure. Fluor Daniel Northwest (FDNW) is a subcontractor to Fluor Daniel Hanford (FDH) and the facility operating contractors and as such the costs of maintaining a qualified staff in FDNW must be paid for from the revenues for FDNW services to their clients. FDH will establish qualification requirements for criticality engineers and specialists so that any competitor of FDNW would have to provide equivalent qualified staff and therefore not be able to underbid FDNW for Project Hanford work.

4. Contractor Signature Section:

Contractor Originator Emil Krejci — Date: 04/10/98

Contractor Approval _____ — Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-02

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

FDH has not provided sufficient funding for the BWHC criticality safety program. The BWHC Level of Effort task ($20K) is depleted such that on-call, after hours criticality safety engineering support from FDNW, is not funded for the remainder of the FY. Approximately 20 criticality safety tasks have been identified by BWHC for which funding has not been identified. Severe budget restrictions and the task order process prevent multiple FDNW criticality safety engineers from supporting BWHC concurrently. FDNW criticality safety staff do not have unilateral, unscheduled access to PFP to inspect operations, and by review processes and procedures. FDH Management is required by ANSI/ANS-8.19 to ensure that criticality safety engineers are provided to furnish technical guidance for operations.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-02

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

At the contractor's request, a response to this observation will be issued after the report has been reviewed.

4. Contractor Signature Section:

Contractor Originator Jerry Martin Date: 04/28/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-03

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

FDH does not have a program or policy establishing comprehensive training and qualification criteria for criticality safety engineering subcontractors providing support to PFP. FDH is reliant on the FDNW training and qualification program currently. There is no requirement that another subcontractor providing services to PFP would have to meet a specified qualification standard.

ANSI/ANS-8.19, Section 4.4 requires management to provide personnel familiar with the physics of nuclear criticality safety and with associated safety practices.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-03

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

The Fluor Daniel Hanford (FDH) requirements for training and qualification of criticality safety engineers is in Section 1.4.8 of HNF-PRO-538. These requirements are under going revision to reflect the M&I contract structure. In addition, the requirements will be changed to ensure experience or knowledge of the facility systems or processes before an engineer is fully qualified to prepare and review criticality safety evaluations for the facility.

4. Contractor Signature Section:

Contractor Originator Emil Krejci Date: 04/10/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-04

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

B. References:

C. Information Requested (list of information needed to complete this form)

For FDNW Criticality Safety Staff, please provide the following information:

1) **Staff attendance at ANS Meetings for the past two years.**
2) **Participation on ANSI/ANS 8 committees or sub-committees during the past two years.**
3) **Staff attendance at the UNM Short Course and LANL/LACEF 5 day course.**

2. Reviewers' Signature Section:

Originator Jerry McKamy _____ Date: 04/01/98

Approved Jerry McKamy _____ Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-04

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

See Attached Table.

4. Contractor Signature Section:

Contractor Originator _____ Date: _____

Contractor Approval _____ Date: _____

	Ken Dobbin	David Erickson	Joe Estrellado	Steve Gedeon	Harvey Goldberg	Jess Greenborg	Karl Hillesland	Steve Kessler	Jay Lan	Ed Miller	Joe Nelson	Robert Richard	Steve Roblyer	Victor Roetman	Robert Ruben	Kevin Schwinkendorf	Warren Wittekind
Conferences:																	
ANS Topical, 6/96						X											
Spectrum 96																X	
ANS National Mtg, 11/96						X											
ANS National, 6/97						X										X	
Chelan Topical 9/97		X				X				X		X	X			X	
ANS National, 11/97						X			X								
RP&S ANS Topical 4/98											X						
NCTSP 91										X							
NCTSP 92		X															
NCTSP 93		X															
NCTSP 94		X								X							
NCTSP 95		X															
NCTSP 96										X							
NCTSP 97		X				X				X							
NCTSP 98 (Tentative)		X	X														
ANS 8.12										X							
Training:																	
Nuclear Criticality Safety Short Course	X	X								X	X	X	X			X	X
Ron Knief Criticality Seminar	X	X			X		X		X	X	X	X	X			X	X
ORNL SCALE Class										X							
WHC MCNP Class		X					X									X	X
Criticality Safety Training, Manager/Engineer		X	X									X	X			X	X
LLNL Crit Class 84			X														
Knoxville Workshop 86			X														
Westinghouse Nuclear Fuel Division Core Design		X														X	X

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities — Form No. MR-05
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities — Date: 04/01/98
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

1. Identification Section:

A. Observation (including Overall Significance and basis):

DOE RL does not review and concur on budget requests and work scope for maintaining criticality safety programs within Hanford subcontractors like BWHC. DOE RL does not verify that BWHC has the funding needed to provide essential criticality safety products and services.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy — Date: 04/01/98

Approved Jerry McKamy — Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities — Form No. MR-05
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities — Date: 04/01/98
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

3. DOE-RL Response (Provide basis and reference):

DOE-RL cannot comment on this item at the present time without knowing the basis, applicable references, and background supporting this observation.
(per telecon with Shiv Seth on 4/21/98)

4. DOE-RL Signature Section:

DOE-RL Originator Don Seaborg — Date: 04/21/98

DOE-RL Approval Don Seaborg for Shiv Seth (per Telecon) — Date: 04/21/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-06

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

DOE RL is understaffed with respect to criticality safety personnel. Experienced criticality safety staff are needed within DOE RL to define criticality safety programs, monitor contractor performance, and support DOE RL Line Management.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-06

Date: 04/01/98

3. DOE-RL Response (Provide basis and reference):

DOE-RL concurs that present staffing is insufficient with respect to criticality safety personnel. DOE-RL requests that the assessment report provide comparative information regarding criticality safety programs at other DOE sites where acceptable staffing levels exist. This information should include staffing levels for full time and temporary (i.e., for periodic assessments) criticality safety staffs, annual budget, number of fissile material facilities at the site, etc.
(per telecon with Shiv Seth on 4/21/98)

4. DOE-RL Signature Section:

DOE-RL Originator Don Seaborg Date: 04/21/98

DOE-RL Approval Don Seaborg for Shiv Seth (per Telecon) Date: 04/21/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-07

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

DOE RL does not have a documented, integrated Criticality Safety Program. No criticality safety surveillances or assessments of criticality safety have been performed and documented, excluding Readiness Assessments. DOE RL has not promulgated guidance and performance expectations to FDH dealing with sitewide implementation of a coherent, integrated criticality safety program at Hanford. DOE RL does not expect to issue such guidance in advance of the expiration of the exclusivity clause in the FDNW contract which occurs in September of 1998. This guidance is essential to assure consistent, technically accurate criticality safety products and services are provided to Hanford when such services can be procured from multiple vendors.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Jerry McKamy Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-07

Date: 04/01/98

3. DOE-RL Response (Provide basis and reference):

DOE-RL disagrees with the statement: "No criticality safety surveillances or assessments of criticality safety have been performed and documented, excluding Readiness Assessments." All fissile material facilities at Hanford have DOE-RL Facility Representatives assigned. The Facility Representatives are required by DOE-RL procedure to perform periodic surveillances and assessments at their assigned facilities per a developed Master Assessment Plan, including criticality safety. Each such surveillance or assessment is performed to guides developed in accordance with the applicable ANS/ANSI standards pertaining to criticality safety. At PFP alone, the following formal criticality safety surveillances and/or assessments have been performed in recent years:

Surveillance: PFP-RB-1995-004, May 30, 1995, "Criticality Safety NSS-18.1"
Assessment: A-95-SOD-PFP-002, November 2, 1995, "Criticality Safety Program"
Surveillance: S-96-SOD-PFP-010, May 13, 1995, "Criticality Safety (Reactive)"
Assessment: A-95-SOD-PFP-014, July 18, 1995, "Criticality Detection and Alarm System (Reactive)"
Assessment: A-97-SOD-PFP-003, February 26, 1997, "Nuclear Safety Assessment"

Also, DOE-RL performed a site wide inspection of all fissile material facilities in 1994, in response to a Secretary of Energy initiative resulting from observed weaknesses in the criticality safety program at the ORNL Y-12 plant earlier that year. This inspection utilized Facility Representative staff augmented by various contractor support personnel with experience in criticality safety. Finally, DOE-RL relies heavily on the Facility Representative presence and observations of daily routines to monitor performance of operations and activities impacting criticality safety.

4. DOE-RL Signature Section:

DOE-RL Originator Don Seaborg Date: 04/21/98

DOE-RL Approval Don Seaborg for Shiv Seth (per Telecon) Date: 04/21/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-08

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

CSR identified unfunded NCS projects requiring CSE support.

B. References:

C. Information Requested (list of information needed to complete this form)

List of CSR identified projects requiring CSE support, but lacking funds.

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-08

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

CSR Review Form MR-08 identifies the Criticality Safety Representative has identified unfunded Nuclear Criticality Safety Projects requiring criticality safety engineer support.

Contractor Response:

BWHC agrees with the observation. Approximately $230,000 in unfunded criticality safety work has been identified.

Task Package 1K6A060A99 Safety Boundary Documentation of the Plutonium Finishing Plant Cost Account Plan contains funds for Safety Analysis Report (SAR) Revisions and Criticality Safety Evaluation Reports (CSER). The Task Package has been impacted by unfunded costs as follows.

1. Declaration of a Discovery Unreviewed Safety Question (PFP-97-05) for the presence of plutonium hydride/nitride in a plutonium metal can. This has required the preparation of a Justification for Continued Operation at a cost of $90,000 (FDNW rough order of magnitude estimate).

2. Declaration of Discovery Unreviewed Safety Question (RL-PHMC-PFP-1997-023) for an uncontrolled chemical reaction at the Plutonium Finishing Plant (PFP). This has required the preparation of a Justification for Continued Operation at a cost of $163,000 (FDNW Task Order PF-804 Release R-07).

3. Actions in response to a Criticality Safety program Review at PFP have required the addition of a criticality safety engineer position at a cost of $110,000 (FDNW Task Order PF-804 Release R-09) and additional CSER's at a cost of $346,000 (FDNW Task Order PF-804 Release R-10).

The following actions to fund or avoid these unanticipated costs have been taken.

1. Revision of the SAR to incorporate the orientation process has been deferred to next fiscal year at a cost savings of $176,000 (FDNW Task Order PF-084 Release R-08).

2. Revision of the SAR annual update has been temporarily deferred at a cost avoidance of $119,000 (FDNW rough order of magnitude estimate). The annual update is an RL milestone and this work will have to be funded or a milestone change negotiated with RL.

3. Prioritization of the CSER revisions referred to in item 3 above. To date only $52,000 in high priority CSER work has been released to FDNW. In addition, the criticality safety engineer position has been funded only through June 1997 at a cost to $74,000. These actions result in a cost avoidance of $234,000.

Note all costs given above include a multiplication factor of 1.13 to fund FDNW Direct Distributed costs, 1.07 to fund FDH Government Furnished Equipment costs, and 1.06 to fund FDNW fee. These costs are not included in the FDNW direct estimates but are funded separately out of the same cost account task package.

4. Contractor Signature Section:

Contractor Originator Alan L. Ramble Date: _____

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-09

Date: 04/02/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

A focal point or owner within the Integrating Management Contractor (IMC) for the Criticality Safety Program is not apparent and/or not sufficiently staffed. FDH has not assumed responsibility for the implementation of Criticality Safety at Hanford.

The Nuclear Safety Program Organization in Fluor Daniel Hanford is the Technical Authority for Criticality Safety Procedures. The ES&H Organization provides annual oversight of facilities through the Facility Evaluation Boards and operating organizations are responsible for the floor level implementation of criticality program requirements. These functions only come together at the President and CEO of Fluor Daniel Hanford. In practice, the individual within the Nuclear Safety Program who is responsible for Criticality Safety devotes most of his time to Authorization Basis document reviews and maintenance of the Criticality Safety Procedures. Sufficient emphasis on overall program responsibility, and oversight of the effectiveness of the Criticality Safety Program was not found.

B. References:

Interviews: Emil Krejci, John Fialkovitch
Presentations: Emil Krejci
ANSI/ANS-8.19, Section 4.6
Criticality Safety General, Requirements, HNF-PRO-334

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Doug Croucher _____ Date: 04/02/98

Approved Jerry McKamy _____ Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
X Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. MR-09

Date: 04/02/98

3. Contractor Response (Provide basis and reference):

FDH Project Direction is the line organization responsible for all safety implementation by the facility operating contractors. This is explicitly documented in the DOE-RL approved Management and Integration Plan. The FDH oversight function is performed by the FDH QA organization. ES&H, in addition to maintaining the FDH criticality program procedures, advises Project Direction in accomplishing their responsibility for effectiveness of the criticality safety program.

4. Contractor Signature Section:

Contractor Originator Emil Krejci _____ Date: 04/10/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-01

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

As Part of CSER development, the PFP and FDNW staffs are not emphasizing choice of engineered controls over administrative controls as barriers for NCS. This is not in accord with good practice, ANS-8.1, or DOE 5480.24.

B. References:

1. WHC-SD-SQA-CSA-513

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 03/31/98

Approved Jerry McKamy Date: 03/31/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-01

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

HNF-PRO-539, "Criticality Safety Evaluations" references both the ANSI/ANS Standards for criticality safety and the DOE Orders 5480.24 and 420.1. Utilization of engineered controls where practical is fundamental to safety in the processing and transportation of fissionable materials. Nearly all of the storage and transportation devices utilized at the PFP contain engineered barriers. Many of the process gloveboxes also contained engineered controls i.e.; geometrically safe tanks and vessels, glovebox partitions (both vertical and horizontal), carousel material storage positions, pedestal storage positions, conveyors with engineered spacing controls, vacuum transfer liquid detection systems, automatic shut-down devices, etc.

The referenced CSER, 96-023 may not, in fact contain the appropriate level of emphasis on engineered controls as opposed to administrative controls. This CSER has been inactivated and is no longer in use. The process will not be restarted until a new CSER analysis and associated CPS, Posting, and Operating Procedures have been developed.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-02

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

FDNW not funded for safety; FDNW funded only for CSERs and Q&As. Not funded for administrative practices for NCS program, e.g., postings, procedure review, surveillance, design input, familiarity with operations, etc.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKarny Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-02

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

At the contractor's request, a response to this observation will be issued after the report has been reviewed.

4. Contractor Signature Section:

Contractor Originator Jerry Martin Date: 04/28/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-03

Date: 04/02/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

NCS engineers should not be assigned to PFP without meeting a site qualification program for NCS engineers. FDNW provides NCS engineers to PFP that have Hanford experience, however, when the exclusivity clause expires in September 1998, there will be the potential to loose qualified engineers immediately.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/02/98

Approved Jerry McKamy Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
_X_ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. NCSSR-03

Date: 04/02/98

3. Contractor Response (Provide basis and reference):

As noted in the response to MR-03, the FDH qualification criteria is under revision and will specify criteria for engineers assigned to facilities under the PHMC.

4. Contractor Signature Section:

Contractor Originator Emil Krejci Date: 04/10/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
X Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-01

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

Postings are cluttered with information. Print reduced in size to increase information. Good human factors engineering for posting required by ANS 8.1 and 8.19 should be applied to color, print size, etc. for postings.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
X Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-01

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

HNF-PRO-541 "Criticality Safety Postings" contains guidance for the development and placement of criticality safety postings in Hanford fissile material facilities. Postings in use at the PFP are designed according to that site criteria. A recent Phase I Readiness Assessment Finding has resulted in a requirement to replace the more than 600 criticality safety postings at the PFP. Improvements to size the format will be made to all postings over the next year.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-02

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

CIT has surveyed postings and CPS(?) and identified improvements needed.

B. References:

C. Information Requested (list of information needed to complete this form)

CIT report on limits/postings needing revision.

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-02

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

Numerous improvements and clarifications to Postings and CPSs have been identified by the Criticality Improvement Team. This is presently underway and will continue for several weeks. Changes will be coordinated and performed on a priority basis. As a result of a Phase I Readiness Assessment Finding, all Criticality Safety Postings in the PFP Facility will be revised within the next year. The improvements suggested will be made at the appropriate time in that replacement schedule.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-03

Date: 04/02/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

Fissile Material Handling Procedure ZO-200-029 has been changed nine times since June 1997. Changes include three total revisions and six administrative or technical revisions. Procedures change process should demand high quality change effort.

B. References:

Fissile Material Handling Procedure, ZO-200-029

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/02/98

Approved Jerry McKamy Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-03

Date: 04/02/98

3. Contractor Response (Provide basis and reference):

The ZO-200-028 Procedure addresses many complex fissile material transportation operations and as such, requires frequent improvement, revision, and review in order to accommodate the continuously changing work environment at the PFP. PFP believes that the record of revision to the ZO-200-028 is representative of our efforts at continuous improvement and are indeed a result of a high quality change effort.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-04

Date: 04/03/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

The PFP CIT has identified deficiencies and discrepancies in CPS and postings. A root cause corrective action plan has not been developed to prevent recurrence.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/03/98

Approved Jerry McKamy Date: 04/03/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
_X_ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. OP-04

Date: 04/03/98

3. Contractor Response (Provide basis and reference):

Finding accepted. A Root Cause analysis will be implemented to prevent recurrence. Numerous corrective actions are already being worked.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/03/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
X Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PENCS-01

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

Alternate CSR is developing fault tree methodology to rate incidents for trending and reporting. Fault trees should be developed during CSLEP to be available for incident evaluation and to provide more clear (than CSERs) basis for safety (NCS).

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
X Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PENCS-01

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

The Criticality Safety Limits Examination Program (CSLEP) presently in process at the PFP will be modified to include (where applicable) fault-tree type analysis for utilization during incident evaluation. CSLEP will examine current, active process CSERs first and will work to inactivate CSERs applicable to processes planned for deactivation and decommissioning.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
X Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PFNCS-02

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

CSER 96-023 does not provide safety basis for damp Pu compounds (feed material) for glovebox. CSER does not evaluate all upset conditions for authorized maximum glovebox inventory.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/02/98

Approved Jerry McKamy Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
X Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PFNCS-02

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

Finding accepted. An Unusual Occurrence reporting the potential OSR Violation associated with the discovery of the inadequacy of CSER 96-023 has been submitted. Additionally, a USQ screening was performed for the potential discovery and DOE/RL has been notified of the results.

Reference: RL—PHMC-PFP-1998-0016 (attached).

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
_X_ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PENCS-03

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

Draft CSERs not marked or otherwise controlled (document control).

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger _____ Date: 04/01/98

Approved Jerry McKamy _____ Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
_X_ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. PENCS-03

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

Finding accepted. A change to the formality of handling DRAFT Criticality Safety Evaluations will be implemented.

4. Contractor Signature Section:

Contractor Originator Fred Crawford _____ Date: 04/14/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
_X_ Planned Response to Nuclear Criticality Accidents

Form No. PRNCA-01

Date: 04/02/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

A procedure does not exist for CAS/TCAS placement on the Hanford site. The engineers performing CAS related calculations have no guidance for how to conduct the evaluation.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator Gypsy Tweed Date: 04/02/98

Approved Jerry McKamy Date: 04/02/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
___ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
_X_ Planned Response to Nuclear Criticality Accidents

Form No. PRNCA-01

Date: 04/02/98

3. Contractor Response (Provide basis and reference):

Implementation of a CAS placement procedure is a Hanford Site issue owned by Fluor Daniel Hanford. The PFP will participate in any effort to develop such a procedure. Any proposed changes to the PFP CAS would be performed by the Fluor Daniel Northwest Criticality and Shielding Group and would be performed per the guidance provided in DOE Order 5480.24 or its replacement, DOE Order 420.1 and associated ANSI/ANS Standards.

BWHC previously self-identified deficiencies with regard to the TCAS placement criteria.

4. Contractor Signature Section:

Contractor Originator Emil Krejci Date: 04/10/98

Contractor Approval _____ Date: _____

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
_X_ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. SR-01

Date: 04/01/98

1. Identification Section:

A. Observation (including Overall Significance and basis):

As Part of CSER development, operations is not formally involved in identifying process upsets (contingencies) for transition activities. CSERs may not identify all credible contingencies without operations working with CSEs on this effort.

B. References:

C. Information Requested (list of information needed to complete this form)

2. Reviewers' Signature Section:

Originator George Bidinger Date: 04/01/98

Approved Jerry McKamy Date: 04/01/98

Review Form

Criticality Safety Program
Review Form

Review Area:
___ Management Responsibilities
_X_ Supervisory Responsibilities
___ Nuclear Criticality Safety Staff Responsibilities
___ Operating Procedures
___ Process Evaluation for Nuclear Criticality Safety
___ Materials Control
___ Planned Response to Nuclear Criticality Accidents

Form No. SR-01

Date: 04/01/98

3. Contractor Response (Provide basis and reference):

PFP utilizes the CSR as the liason between Operations and Criticality Engineering for the purpose of CSER development. This responsibility is defined in the HNF-PRO-334, "Criticality Safety General Requirements" and in the PFP Facility Administrative Procedure, FSP-PFP-5-8, Section 3.3, "Criticality Safety." Although Operations Management is not directly involved in CSER development, their concerns and requirements are communicated to the Criticality Engineer through the CSR. In many instances, CSER development includes the Criticality Engineer, the CSR, the Cognizant Engineer, Process Engineering, Operators, and Operations Management. The level of involvement is somewhat dependent upon the process being analyzed.

Process upsets (contingencies) are identified by the CSR in conjunction with Operations Personnel and Management, and the Criticality Engineer for every CSER document produced for the PFP.

In addition to presently mandated training, FDNW NCS Specialists are to provide training for Transition Operations Shift Managers to improve their understanding of the contingencies involved with criticality safety at PFP. After this training is complete, Shift Managers with the help of the CSR, FSR, and NCS Specialists will provide more specific criticality safety training for specific jobs. The change in the training procedure will be formalized as a revision to FSP-PFP-5-8, Section 2.3.

4. Contractor Signature Section:

Contractor Originator Fred Crawford Date: 04/14/98

Contractor Approval _____ Date: _____

Appendix E

White Paper On

CSER 96-023: CSER For PFP Glovebox HC-21A WITH 4.4 Kilogram Plutonium Cans, WHC-SD-SQA-CSA-520, Rev. 0

WHITE PAPER
ON
CSER 96-023: CSER FOR PFP GLOVEBOX HC-21A WITH 4.4 KILOGRAM PLUTONIUM CANS, WHC-SD-SQA-CSA-520, REV. 0

BACKGROUND

As part of a DOE nuclear criticality safety (NCS) assessment conducted at PFP on March 30 to April 3, this CSER was evaluated. The glovebox is approved to load either a maximum 7.5 kilograms (kg) of plutonium (Pu) metal buttons or 15 kilograms of Pu compounds into the glovebox. The Pu is loaded into tray and moved to another glovebox where the material is calcined in muffle furnaces. The calcined Pu oxide in the trays is returned to the original glovebox for packaging 4.4 kg of Pu in storage cans.

This white paper focuses mainly on the 15-kg mass limit for Pu compounds as calcine-feed material to the glove box. It also mentions a weakness in the trays of calcined material.

NCS LIMITS

The applicable administratively controlled limits from Section 3 of the CSER are:

1) When plutonium metal is not present, glovebox maximum is 15.0 kg plutonium.

4) The following operations have limits of plutonium mass and volume of containers in each group spaced less that 25 cm (10 in.) apart.

8) A maximum 2.5 liter container volume . . .

10) Do not stack plutonium bearing containers.

The 15-kg limit for Pu in the glovebox exceeds the ANSI/ANS-8.1 subcritical limit of 0.48 kg (See Table1) for Pu nitrate. The 15 kg mass limit does not provide a safety basis for operations. Therefore, other limits and associated controls must be added as a safety basis before a larger mass limit can be justified. The CSER projects three additional limits to support the larger mass limit.

An appropriate limit to allow a larger Pu mass in the glovebox is moderation control. The limits and controls such a condition were not established although an evaluated contingency was for H/Pu > 2. However no limits were established. No controls were established on use of plastic containers that would add moderator to the system. An upset condition – fire suppression using water - was recognized, but no controls were established. Moderation control does not provide a safety basis for operations.

The CSER attempted to use a combination of mass and volume limits, but neglected to establish volume controls for the incoming Pu compound feed material. Individual containers are volume-limited, but the number of containers is not limited. Hence using the parameters in Table 6.1 of the CSER is not valid. The limits and controls derived from Table 6.1 do not provide a safety basis for operations.

There is no explicit spacing requirement for the Pu compound feed material in the glovebox. Administrative controls are established for the calcined material, so it can be argued that spacing controls exist for the incoming feed material since spacing requirements exist for all other materials. However, the spacing control is administrative in nature; no justification is provided for nonuse of engineered spacing controls. This is an administrative control that does not prevent the existence of 15 kg of moderated Pu compounds in one unit in the glovebox.

The volume limit for the containers does not control the shape of the container. This volume limit by itself does not provide a safety basis because the geometry of the container and the number of containers are not specified. There could be tens and tens of containers that are two inches high or twenty inches high and still meet the volume restraint. Increasing the number of containers and increasing the height of a group of containers decreases the neutron leakage and decreases the critical mass of Pu accordingly. Hence the volume limit on containers in the glovebox does not provide a safety basis for operations.

Note: This paper is focused on the 15 kg mass limit. The lack of shape control on the furnace trays is of concern for the calcined material as well because the trays are assumed to have a maximum height in the safety evaluation. This assumption is not carried over to the limits and controls on tray for operations.

The limit on stacking containers does provide some safety because under normal operations it does limit the height of the array of containers to a one-high array. (As discussed above, the height is limited only by the height of the container that is not specified in this CSER). All things being equal, the neutron leakage will be higher from a one high array that a two high array with a consequent reduction in the neutron multiplication factor for the array. However, in a process upset (contingency) Pu bearing containers could be placed on top of the one-high array. This contingency was not evaluated by FDNW.

DOUBLE CONTINGENCY EVALUATIONS

The double contingency principle is found in ANSI/ANS-8.1 and in DOE orders. Basically, the NCS engineer must show that normal conditions are safely subcritical and that any anticipated process upset will also be subcritical. In this CSER, the normal condition would be 15 kg of Pu compounds in the glove box.

Systematically, credible process upsets that could violate the limits must be evaluated and shown to be subcritical. This evaluation process simply was not done for 15 kg of feed material Pu compounds in this glovebox. All the emphasis was put on the Pu metal limits and on the calcined material to be processed in the glovebox. However, many of the process upsets (contingencies) for the metal and calcined material were evaluated with less that the maximum mass loading for the glovebox. This does not conform to the double contingency principle and does not provide a safety basis for operations.

Appendix F

Examples of Performance Measures

Some Examples of Performance Measures

All infractions are closed in 90 days or less.

50% of infractions are closed in 30 days with none over 90 days.

No more than three of the same type of infraction occurs within a six-month period.

The CSE performs one criticality safety audit per month.

The CSE audits all operational areas of the facility annually with a specific schedule for assessments of individual areas (not a single annual event but the cumulation of smaller, in depth audits).

Less than 20% of infractions discovered by ESH&Q, the CSR, CSE, FEB or Fac. Rep. for the first nine months; zero, thereafter.

No more than 10% defects in the approved CSERs, CPSs and Postings for the first year; 1% thereafter.

All CSE formally qualified by a specified date.

20% of the CSES attend each professional technical conference; through the year, at least 40% of the CSES has attended at least one conference.