S

ENGINEERING CHANGE NOTICE

Page 1 of 5

1. ECN 657683

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [X] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	NH. Dehkordi, 1AK00, T4-20, 376-6702	[X] Yes [] No	3/29/00
	6. Project Title/No./Work Order No.	7. Bldg./Sys./Fac. No.	8. Approval Designator
	UPDATE CGI CRITICAL CHARACTERISTICS DOCUMENT/110740	234-5Z/12	SQ
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.)	10. Related ECN No(s).	11. Related PO No.
	HNF-5043, Rev. 0	NONE	N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change 13b. Design Baseline Document? [X] Yes [] No

Add the following items to the document (generic items):

"26. Transformers
- Number of the phases, Single or Multiple
- Phase connection, Delta or Y (Multi-phase transformers only)
- Power rating ~~in KVA~~. MHD 4/12/00
- Voltage Rating ~~in KV~~."

MHD 4/5/00

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Add items to the CGI Critical Characteristics document to support material procurement for various standby power system modifications.

See pages 3-4 for USQ.
Independent Review performed per FSP-445.

15. Distribution (include name, MSIN, and no. of copies)

R.D. KECK	T4-20	PFP SAFETY	T5-11
N.H. DEHKORDI	T4-20	L.E. EDVALSON	T5-48
K.M. IRISH	T4-19	D.R. GROTH	T4-15

RELEASE STAMP

APR 12 2000

DATE:

STA: 5

HANFORD RELEASE

ID: 24

A-7900-013-1

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 657683

16. Design Verification Required	17. Cost Impact				18. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[X] Yes	Additional	N/A	Additional	N/A	Improvement	N/A
[ ] No	Savings	N/A	Savings	N/A	Delay	N/A

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[ ]	Seismic/Stress Analysis	[ ]	Tank Calibration Manual	[ ]
Functional Design Criteria	[ ]	Stress/Design Report	[ ]	Health Physics Procedure	[ ]
Operating Specification	[ ]	*Interface Control Drawing*	[ ]	*Spares Multiple Unit Listing*	[ ]
Criticality Specification	[ ]	Calibration Procedure	[ ]	Test Procedures/Specification	[ ]
Conceptual Design Report	[ ]	Installation Procedure	[ ]	Component Index	[ ]
Equipment Spec.	[ ]	Maintenance Procedure	[ ]	ASME Coded Item	[ ]
Const. Spec.	[ ]	Engineering Procedure	[ ]	Human Factor Consideration	[ ]
Procurement Spec.	[ ]	Operating Instruction	[ ]	Computer Software	[ ]
Vendor Information	[ ]	Operating Procedure	[ ]	Electric Circuit Schedule	[ ]
OM Manual	[ ]	Operational Safety Requirement	[ ]	ICRS Procedure	[ ]
FSAR/SAR	[ ]	IEFD Drawing	[ ]	Process Control Manual/Plan	[ ]
Safety Equipment List	[ ]	Cell Arrangement Drawing	[ ]	Process Flow Chart	[ ]
Radiation Work Permit	[ ]	Essential Material Specification	[ ]	Purchase Requisition	[ ]
Environmental Impact Statement	[ ]	Fac. Proc. Samp. Schedule	[ ]	Tickler File	[ ]
Environmental Report	[ ]	Inspection Plan	[ ]	None	[X]
Environmental Permit	[ ]	Inventory Adjustment Request	[ ]		[ ]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
None.		

21. Approvals

	Signature	Date
Design Authority	RD. Keck	4/5/00
Cog. Eng.	RD. Keck	
Cog. Mgr.	RA. Burk	4/10/00
QA		4-05-00
Safety		5 Apr 00
Environ.		
Des. Ver.		
Other INF Review		4/5/00

	Signature	Date
Design Agent		
PE		
QA		
Safety		
Design		
Environ.		
Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

UNREVIEWED SAFETY QUESTION (USQ) SCREENING AND EVALUATION

1. IDENTIFICATION NUMBER: ECN 657683	USQ SCREENING	Page 3 of 5

2. TITLE: UPDATE CGI CRITICAL CHARACTERISTICS DOCUMENT, HNF-5043

INSTRUCTIONS: *Respond to each question and provide justification for each response. A re-statement of the question does not constitute a satisfactory justification or basis. An adequate justification provides sufficient explanation such that an independent reviewer could reach the same conclusion based on the information provided (DOE 5480.21, 10.e.1).*

DESCRIPTION:

ECN 657683 modifies HNF-5043, "Standby Power System Commercial Grade Item Critical Characteristics" Rev. 1. This document identifies the critical characteristics for Commercial Grade Item (CGI) procurements for the Standby Power System.

INTRODUCTION:

PFP's Standby Power System consists of the diesel generators, the generator control system, Rm 308 UPS, switchgear batteries, and the electrical equipment used to distribute this power. Due to the nature of the equipment and its use throughout general industry, the majority of the system falls within the CGI definition. HNF-PRO-268, "Control of Purchased Items and Services" and HNF-PRO-1819, "PHMC Engineering Requirements" require that the critical characteristics of CGI-procured equipment be established in an engineering document prior to placing the order. HNF-5043 established these critical characteristics for the Standby Power System. This modification adds several items to the document.

AFFECTED SSC:

HNF-5043 establishes the critical characteristics for CGI procured for use in the Standby Power System. No other SSCs are affected.

AUTHORIZATION BASIS:

PFP's Standby Power System is covered by the PFP Final Safety Analysis Report (FSAR), HNF-SD-CP-SAR-021, Rev.1, ECN 649956, "Thermal Stabilization Project, Pre-ORR Support," and ECN 649958, "Thermal Stabilization Project, Pre-ORR Support." There are no OSRs, LCOs, or Surveillance Requirements associated with this system. The remaining documents of FSP-PFP-5-8, Section 2.23, Appendix A, Rev. 22 do not apply.

CONCLUSION:

The proposed modifications to HNF-5043 are within the bounds of the Authorization Basis. All screening questions have been answered "No" or "N/A" so a USQ Evaluation is not required. No changes to the Authorization Basis are required.

REFERENCES:

HNF-PRO-1819, "PHMC Engineering Requirements," Rev. 3.
HNF-PRO-268, "Control of Purchased Items and Services," Rev. 3.
HNF-SD-CP-SDD-024, "Definition and Means of Maintaining the 2721-Z Standby Power System Portion of the PFP Safety Envelope," Rev. 1.

QUESTIONS:

1. Does the proposed change or occurrence represent a change to the facility or procedures as described in the Authorization Basis?
   [ ] N/A [X] No [ ] Yes/Maybe

   BASIS: The Standby Power System is described in general in HNF-SD-CP-SAR-021, Plutonium Finishing Plant Final Safety Analysis Report, sections 1.2.2.1.7, Table 4-7, 5.1.2.4.1, 5.2.8.6.2, and 5.4.2. These descriptions do not specify the type, manufacturer, or specifications of any individual system equipment. Documenting the minimum critical characteristics for specific system equipment does not change any of these descriptions.

2. Does the proposed change or occurrence represent conditions that have not been analyzed in the Authorization Basis?
   [ ] N/A [X] No [ ] Yes/Maybe

   BASIS: The Standby Power System is not part of any accident scenarios in Chapter 9 of the FSAR. Additionally, Engineering and QA requirements dictate that CGI procured equipment is functionally tested prior to returning the system to service. This ensures that the equipment will perform its required safety function as intended.

UNREVIEWED SAFETY QUESTION (USQ)
SCREENING AND EVALUATION

1. IDENTIFICATION NUMBER: ECN 657683	**USQ SCREENING**	Page 4 of 5

2. TITLE: UPDATE CGI CRITICAL CHARACTERISTICS DOCUMENT, HNF-5043

3. Does the proposed change represent a test or experiment NOT described in the Authorization Basis that may affect the safe operation of the facility?
[X] N/A [ ] No [ ] Yes/Maybe

BASIS: No new tests or experiments will be introduced by this change.

4. Does the proposed change or occurrence represent a change to the Technical Safety Requirements or a reduction in the margin of safety defined in the Technical Safety Requirements?
[ ] N/A [X] No [ ] Yes/Maybe

BASIS: The OSRs, in their capacity as TSRs do not contain any requirements concerning this system. There are no LCOs, Administrative Controls, or Surveillance Requirements associated with this system. There are no margins of safety defined in the OSR.

USQE No. 1: NH. Dehkordi (Print Name)

USQE No. 1: Nazar H. Dehkordi 1/5/00 (Signature / Date)

USQE No. 2: RD. Keck (Print Name)

USQE No. 2: [signature] 1/5/00 (Signature / Date)

If there is a Yes/Maybe response to Questions 1, 2, 3, or 4, then a USQ Evaluation must be completed.

The following guidance should be considered when completing this screening. *This guidance should not be considered all-inclusive.* Additional factors may need to be considered depending on the nature of the proposed change.

Does the proposed change:

1) *Modify*, add, or delete a safety class function of a structure, system or component stated in the Authorization Basis?
2) Alter the design of a structure, system or component as described in the Authorization Basis?
3) Modify, add, or delete the description of operation, operating environment, or analyses of any system or component described in the Authorization Basis?
4) Modify, add, delete, or conflict with any of the design bases stated in the Authorization Basis?
5) Conflict with the principle or general design criteria stated in the Authorization Basis?
6) Modify, add, or delete any plant design features described in the Authorization Basis?
7) Modify, add, or delete a flow diagram or facility drawing provided in the Authorization Basis?
8) Create the potential for new system or component interactions (e.g., seismic, electrical breaker coordination)?

DESIGN PROCESS RECORD

DATE: 04/3/00
ECN: 657683
JCS: N/A
PAGE 5 OF 5

TITLE: ADD CGI Critical Characteristics to HNF-5043

Design Agent: N.H. Dehkordi Design Authority: RD. Keck

System Classification: ☐ SC ■ SS ☐ GS
Does Mod Affect System SE? ☐ Yes ■ No ■ N/A
Project: ■ ECN Only ☐ Design File

PLANNING	☐ Conduct Walkdown ☐ Plant Forces Work Review ☐ Preliminary AJHA ☐ Environmental (HNF-PRO-452) ☐ RadCon review ☐ Basic Radiological Design Checklist	Comment: No Basic Radiological Design Checklist was completed since this is not a modification work.
DESIGN INPUTS	☐ Form, Fit, or Function Constraints ☐ National Codes ☐ Applicable Standards ☐ Regulatory Requirements ☐ Impact on Safety function of system ☐ Maintenance Requirements ☐ Vendor Information ☐ Criticality Safety ☐ Corrosion Control ☐ Natural Hazards ☐ Environmental Susceptibility ☐ Cost/Parts Availability ☒ Other: HNF-5043	Critical characteristics must ensure the item will adequately perform its safety function. For the transformers, to operate safely, we have to ensure that proper phase arrangement and proper power and voltage ratings are specified.
DESIGN ANALYSIS & CALCULATIONS	☐ DAR Checklist(HNF-PRO-239) ☐ Electrical Load ☐ Spare Part (HNF-PRO-447) ☐ Crit. Eng'r Analysis (HNF-PRO-544) ☐ Other:	Comment: N/A
DESIGN OUTPUT	■ ECN ☐ Drawing ☐ Specification ☐ BOM ☐ Vendor Information (HNF-PRO-444)	Comment: ECN changes HNF-5043.
INTERFACE REQUIREMENTS	SYSTEM # SYSTEM NAME	Comment: None.
VERIFICATION (HNF-PRO-445)	☐ Informal Review (GS ONLY) ■ Independent Review ☐ Alternate Calculations ☐ Qualification Testing ☐ Formal Review	Reviewer: DL. McKinnis Comment/Documents Reviewed: HNF 5043

Engineering Manager:
R.A. Burk — Signature
4/10/00 — Date

HNF-5043
Revision 1

PFP STANDBY POWER SYSTEM COMMERCIAL GRADE ITEM CRITICAL CHARACTERISTICS

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Project Hanford Management Contractor for the
U.S. Department of Energy under Contract DE-AC06-96RL13200

Fluor Hanford
P.O. Box 1000
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HNF-5043
Revision 1
ECN 657683

PFP STANDBY POWER SYSTEM COMMERCIAL GRADE ITEM CRITICAL CHARACTERISTICS

NH Dehkordi
Fluor Hanford

Date Published
September 1999

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

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U.S. Department of Energy under Contract DE-AC06-96RL13200

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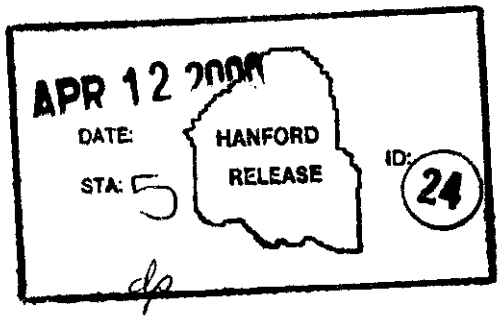
Release Approval 4/11/00 Date



Total Pages 9

Printed in the United States of America

RECORD OF REVISION	(1) Document Number HNF-5043	Page 1

(2) Title
PFP STANDBY POWER SYSTEM COMMERCIAL GRADE ITEM CRITICAL CHARACTERISTICS

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	Released on EDT-626649 dated 9/16/99		
1 RS	Added item 26 per ECN 657683, incorporated ECN 650876 and ECN 650882.	RD. Keck 4/6/00	RA. Burk 4/11/00

1.0 PURPOSE

This document specifies the critical characteristics for Commercial Grade Items (CGI) procured for PFP's diesel generator system, as required by HNF-PRO-268 and HNF-PRO-1819. These are the minimum specifications that the equipment must meet in order to properly perform its safety function. There may be several manufacturers or models that meet the critical characteristics for any one item.

2.0 BACKGROUND

PFP's Standby Power System includes the 2721-Z diesel generators, the Room 308 UPS, the 125 VDC Switchgear batteries, and the electrical distribution equipment to deliver standby power to the required loads. Specific system boundaries and justifications are contained in HNF-SD-CP-SDD-024, "Definition and Means of Maintaining the 2721-Z Backup Power System Portion of the PFP Safety Envelope." A large percentage of this system is made up of standard industry components, such as diesel engine accessory equipment, generator control modules, and standard circuit breakers. The Standby Power System was designated a Safety Significant system on November 1, 1998. This new safety designation changed the procurement requirements associated with the system, and necessitates procurement of most system equipment as Commercial Grade Items in accordance with HNF-PRO-268, "Control of Purchased Items and Services."

3.0 SCOPE

Since the safety function of the Standby Power System does not impose any requirements unique to PFP, and due to the common use of various standby power systems throughout commercial industry, standard industry equipment is acceptable for most of PFP's Standby Power System. The following list of critical characteristics details the minimum specifications for this standard industry equipment. The critical characteristics are verified through a combination of receipt inspections and installation testing.

Due to the interactive nature of the individual standby power systems and their controls, the following characteristics assume the new part is either the same manufacturer and part number or a replacement part specified by the vendor. Further information for the listed equipment is available from the appropriate Vendor Information (VI) files.

4.0 CRITICAL CHARACTERISTIC LISTING

1. Magnetic Pickup Unit

Critical Characteristics:

- 0.5-30 V_{RMS} supplied to governor when properly adjusted.
- Adjusted 5/8 to 7/8 of a turn back from contact with flywheel.

2. Governor Module

Critical Characteristics:

- Controls steady-state generator frequency at 60 ± 0.1 Hz.
- Returns generator to base frequency after manual override of actuator (see figure 6 on page 247 of VI 21221 for example).
- Engine idle is stable without surging. Controls engine speed using input from synchronizer to allow synchronization with energized bus within 30 seconds.
- Controls engine actuator during load test with input from load share module to obtain generator output near set point (normally 250 kva) without oscillation.

3. Synchronizer Module

Critical Characteristics:

- Provides phase error signal to the governor and breaker closure signal within 30 seconds when line and generator's phases are matched as observed on the synch scope.

4. Actuator Assembly

Critical Characteristics:

- Controls engine speed with governor input to provide steady-state generator frequency at 60 ± 0.1 Hz
- Controls engine power during load test with input from load share module to obtain generator output near set point (normally 250 kva) without oscillation.

5. Load Share Module

Critical Characteristics:

- Provides stable control output to governor during load test as evidenced by generator output being maintained near set point (normally 250 kVa) without oscillation.
- Under load sharing for two generator providing 2736-ZB backup power, load split between two generators is no worse than 60%-40%.

6. Engine Block Heater

Critical Characteristics:

- Maintains engine coolant temperature 90-200°F

7. Resistors (generic item)

Critical Characteristics:

- Specified resistance
- Power rating
- Tolerance

8. Transistors/Diodes (generic items)

Critical Characteristics:
- Transistor or diode designation

9. Relays (generic item)

Critical Characteristics:
- Base or socket configuration as specified.
- Contact rating as specified.
- Coil voltage as specified.
- 80% Pickup voltage.

10. Filters (Fuel, Oil, Cooling Water, Air)

Critical Characteristics:
- Proper type (fuel, oil, water, or air).
- Physically fits filter receptacle with no noted leakage.

11. Galvanized Steel Reducers, nipples, adapters, etc for cooling system

Critical Characteristics:
- Conform to ASTM A53, Type E or S, Grade B, ASTM A106 grade B, ASTM A197, or ASTM A733.
- Size as specified.

12. Block Heater Coolant Hose

Critical Characteristics:
- Rated for at least 200°F.
- Size as specified.

13. Fuel Hoses

Critical Characteristics:
- Rated for diesel fuel use.
- Size as specified.

14. Cord Caps (male and female)

Critical Characteristics:
- UL listed.
- Amp rating as specified.

15. Engine Oil

Critical Characteristics:
- Meets API CF-4 or CG-4 performance categories.
- Viscosity grade of SAE 15W-40.

16. Diesel Fuel

Critical Characteristics:
- No. 2 or better diesel fuel.

17. Antifreeze

Critical Characteristics:
- Conforms to ASTM D-3306/D-4985.

18. Water

Critical Characteristics:
- Distilled, demineralized, or de-ionized water.

19. Grease

Critical Characteristics:
- Lithium based.
- Operating range 0-275°F

20. Circuit Breakers

Critical Characteristics:
- Time-current curve as specified.

21. Wire connectors, lugs, splices, and terminals:

Critical Characteristics:
- UL listed for use.
- Size as specified.

22. Switches (generic item):

Critical Characteristics:
- Number of poles.
- Number of throws.
- Minimum contact rating as specified.

23. Wire (generic item):

Critical Characteristics:
- Insulation type as specified.
- Size as specified.

24. Receptacles (generic item):

Critical Characteristics:
- UL listed.
- Amp rating as specified.

25. Power cords (generic item):

Critical Characteristics:
- UL listed.
- Amp/Voltage rating as specified.

26. Transformers:

Critical Characteristics:
- Number of phases, Single or Multiple.
- Phase connection, Delta or Y (Multi-phase transformers only).
- Power rating.
- Voltage rating.

3.0 REFERENCES

A. HNF-PRO-268, "Control of Purchased Items and Services," Rev. 3.

B. HNF-PRO-1819, "PHMC Engineering Requirements," Rev. 3.

C. Vendor Information file 21221.

D. HNF-SD-CP-SDD-024, "Definition and Means of Maintaining the 2721-Z Backup Power System Portion of the PFP Safety Envelope," Rev. 1.

E. Cummins Bulletin 3810340-02, "Cummins Engine Oil Recommendations."

F. Cummins Bulletin 3666132, "Cummins Coolant Requirements and Maintenance."