

3.7 PLANT SYSTEMS

3.7.A FIRE PROTECTION SYSTEMS

3.7.A.2 Fire Protection Water Spray and Sprinkler Systems

TRO 3.7.A.2 The following Fire Protection Water Spray and Sprinkler Systems, as listed in AP-64.1, shall be OPERABLE:

- a. Electrical Tunnel Preaction Water Spray System (EI-34' & EI-43').
- b. Diesel Generator Building Water Spray System (EI-15').
- c. Containment Fan Cooler Charcoal Filter Dousing System (EI-68').
- d. Water Spray System at PAB door DR-1-PA to main transformer yard (EI-18').
- e. Turbine Building Pipe Bridge Water Spray System (EI-41' 2 1/2" & 52'4").
- f. Auxiliary Feedwater Pump Room Wet Pipe Sprinkler System (EI-18'6").

APPLICABILITY: Whenever equipment protected by the water spray or sprinkler system is required to be OPERABLE.

NOTES

1. Separate condition entries are allowed.
2. TRO 3.0.C is not applicable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more systems described in TRO 3.7.A.2.a and TRO 3.7.A.2.f inoperable.	A.1.1 Establish a continuous fire watch and backup fire suppression equipment for the unprotected area(s), <u>OR</u>	1 hour
	A.1.2.1 <u>VERIFY</u> smoke detectors in the affected area to be OPERABLE,	1 hour
	<u>AND</u> A.1.2.2 Establish an hourly fire watch and backup fire suppression equipment for the unprotected area(s).	1 hour
	<u>AND</u> A.2 Restore the inoperable system(s) to OPERABLE status.	14 days
B. One or more of the systems described in TRO 3.7.A.2.b, 3.7.A.2.c, 3.7.2.A.d, and 3.7.A.2.e inoperable.	B.1 Establish a continuous fire watch and backup fire suppression equipment for accessible unprotected area(s).	1 hour
	<u>AND</u> B.2 Restore the inoperable system(s) to OPERABLE status.	14 days
C. Required Actions and Completion Times of A.2 <u>OR</u> B.2 not met.	C.1 Submit a Special Report to the On-Site Safety Review Committee according to TRM 5.4.B.	30 days

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TRS 3.7.A.2.1	DEMONSTRATE that each accessible valve (manual, power operated, or automatic) in the flow path is in the correct position.	31 DAYS
TRS 3.7.A.2.2	Valve Cycling Test - Exercise each valve necessary for proper functioning of any portion of this system required for protection of safe shutdown systems through at least one complete cycle: (i) Valves testable with plant in MODE 1. (ii) Valves not testable with plant in MODE 1.	(i) 12 months (ii) 24 months
TRS 3.7.A.2.3	System Functional Test - Includes simulated automatic / remotely operated actuation of system and verification that automatic / remotely operated valves in the flow path actuate to their correct position. (i) Systems described in TRO 3.7.A.2.a, 3.7.A.2.b, 3.7.A.2.d, 3.7.A.2.e, and 3.7.A.2.f (ii) System described in TRO 3.7.A.2.c	(i) 18 months (ii) 24 months
TRS 3.7.A.2.4	Header Visual Inspection - DEMONSTRATE integrity. (i) Systems described in TRO 3.7.A.2.a, 3.7.A.2.b, 3.7.A.2.d, 3.7.A.2.e, and 3.7.A.2.f (ii) System described in TRO 3.7.A.2.c	(i) 18 months (ii) 24 months
TRS 3.7.A.2.5	Visual Inspection of each Spray Nozzle - DEMONSTRATE that each nozzle's spray area is unobstructed. (i) Systems described in TRO 3.7.A.2.d and 3.7.A.2.e. (ii) System described in TRO 3.7.A.2.c	(i) 18 months (ii) 24 months
TRS 3.7.A.2.6	Air Flow Test - Perform air flow test through each open spray nozzle and DEMONSTRATE each open spray nozzle is unobstructed. (i) Systems described in TRO 3.7.A.2.c, TRO 3.7.A.2.d, TRO 3.7.A.2.e.	3 years
TRS 3.7.A.2.7	For systems described in TRO 3.7.A.2.a, 3.7.A.2.b, and 3.7.A.2.f, automatic (i.e., closed head) spray nozzles and sprinklers shall be inspected visually to DEMONSTRATE that no damage exists and that the spray nozzle/ sprinkler is unobstructed.	18 months

Note 1: Surveillance requirements TRS 3.7.A.2.6 may be satisfied by a water flow test through each open spray nozzle which demonstrates that each open spray nozzle is unobstructed.

BASES

TRO

This Technical Requirement ensures OPERABILITY of fire protection and detection systems that protect safety related systems and components that are required to shutdown the reactor and mitigate the consequences of postulated accidents and maintain it in a safe shutdown condition and those fire suppression systems which form in part the basis for compliance with 10 CFR 50, Appendix R.

APPLICABLE SAFETY ANALYSIS

IP3 fire protection and detection systems conform to:

- NRC FP SER dated March 6, 1979 as supplemented by NRC letter dated May 2, 1980
 - NRC FP SER dated January 7, 1987.
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SURVEILLANCE

This Technical Requirement establishes the surveillance program for Fire Protection Water Spray and Sprinkler Systems that protect safe shutdown equipment. This surveillance program DEMONSTRATES OPERABILITY of these systems and provides assurance that the systems will perform their intended function.

Containment is not considered normally accessible during plant operation.

ACTIONS

A.1.2.1

When implementing an hourly roving watch in lieu of a continuous watch, VERIFY smoke detectors to be OPERABLE in the affected area. IF the smoke detectors in the affected area are determined to be inoperable while applying this compensatory action, THEN within 1 hour, restore the smoke detector(s) to OPERABLE status or apply a continuous watch in the affected area (reference 2).

REFERENCES:

1. Nuclear Safety Evaluation NSE 95-03-334-FP, "Revision to the Operational Specifications to Reflect Electrical Tunnel Smoke Detector System Operability Criteria and Compensatory Measures for Spray/Sprinkler Systems."
 2. Nuclear Safety Evaluation NSE 96-3-395-FP, "Development of Administrative Procedure AP-64.1 and Evaluation of a Change to Operational Specifications 3.2 and 3.5."
 3. FSAR 9.6.2
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3.7.A.4 Fire Detection Systems

TRO 3.7.A.4 The minimum number of fire detectors for each location listed in AP-64.1 shall be OPERABLE.

APPLICABILITY: Whenever equipment in that location is required to be OPERABLE.

NOTES

1. Separate Condition entries are allowed.
2. TRO 3.0.C is not applicable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more fire locations with less than the minimum number of required fire detectors listed in AP-64.1 OPERABLE.	A.1 Establish an hourly fire watch patrol, where accessibility permits, in the affected location(s), <u>AND</u>	1 hour
	A.2 Restore the required fire detectors to OPERABLE status.	14 days
B. Less than the minimum number of required fire detectors in diesel generator compartment(s), OPERABLE <u>AND</u> CO ₂ Fire Protection System(s) within affected compartment(s), unavailable.	B.1 Establish a continuous fire watch and backup fire suppression equipment for the diesel generator compartment(s) where the CO ₂ Fire Protection System(s) are unavailable, <u>AND</u>	1 hour
	B.2 Restore required fire detectors in the affected diesel generator compartment(s) to OPERABLE status.	14 days
C. Required Action and Completion Time of A.2 <u>OR</u> B.2 not met.	C.1 Submit a Special Report to the OSRC in accordance with specification 5.4.B.	30 days

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TRS 3.7.A.4.1	Smoke Detectors - DEMONSTRATE OPERABILITY of the detectors listed in AP-64.1.	12 months
TRS 3.7.A.4.2	Heat Detectors - DEMONSTRATE OPERABILITY of the detectors listed in AP-64.1 as follows: (i) All detectors except those associated with VC building FCUs and CO2 systems. (ii) Those detectors associated with the VC building FCUs and CO2 systems.	(i) 12 months (ii) 24 months
TRS 3.7.A.4.3	Flame Detectors- DEMONSTRATE OPERABILITY of the detectors listed in AP-64.1.	184 days

BASES

TRO

These specifications are established to assure the OPERABILITY of Fire Detection Systems provided to protect equipment utilized for safe shutdown of the unit. Containment is not considered normally accessible during MODEs 1, 2, 3, and 4.

APPLICABLE SAFETY ANALYSIS

The fire protection and detection systems installed at IP3, conform to Appendix A of Branch Technical Position (BTP) APCS 9.5-1 "Fire Protection for Nuclear Power Plants", as approved by the NRC Regulatory Staff on March 6, 1979 as Amendment No. 24 to facility operating license No. DPR-64, and supplements thereto.

NSE 97-3-302-FP-CO2, Rev. 0, allows an hourly fire watch patrol in lieu of a continuous fire watch in the emergency diesel generator compartment(s) when its CO2 fire protection system is unavailable with its fire barriers, sprinkler system and detection system meeting certain requirements. If its sprinkler system, barriers or detection system becomes degraded below these requirements then TRO 3.7.A.2, 3.7.A.3, and 3.7.A.4, respectively, require establishing a continuous fire watch for the affected diesel compartment(s).

NSE 97-3-400FP CO2, Rev. 1, evaluated the installation of a door release system for fire door FDR-30-CB. Fire door FDR-30-CB provides protection from the spread of a fire through the doorway in the fire barrier between the cable spreading room (fire area CTL-3) and the Electrical Tunnel (fire area ETN-4). Since the door is a normally open door, integrity of the barrier in the event of a fire, is assured by automatic closure of the door. Two pairs of heat detectors have been installed in the electrical tunnel entryway that will actuate the door release mechanism upon one pair detecting a

fire. Additionally, the door release mechanism will be actuated upon the cable spreading room heat detection associated with the CO2 system. The Fire door FDR-30-CB also provides a support function by remaining open during abnormal and accident conditions to ensure ventilation cooling of safety-related equipment in the cable spreading room by the Electrical Tunnel Ventilation System's exhaust fans.

NSE 96-3-395-FP, revision 1 justifies extending the frequency for testing smoke detectors from every 6 months to every 12 months. The frequency of 12 months for periodic testing smoke detectors is adequate for reasonable assurance of system functionality and availability. This is based in part on IP3 experience and NFPA 72-1996 as evaluated in NSE 96-3-395-FP, revision 1.

SURVEILLANCE

These Technical Requirements establish the surveillance program for Fire Detection Systems provided to protect equipment utilized for safe shutdown of the unit. This surveillance program is intended to DEMONSTRATE the OPERABILITY of these systems and provide assurance that the systems will perform their intended function.

TRS 3.7.A.4.1

The frequency of 12 months for periodic testing smoke detectors is adequate for reasonable assurance of system functionality and availability. This is based in part on IP3 experience and NFPA 72-1996 as evaluated in NSE 96-3-395-FP, revision 1.

TRS 3.7.A.4.2.(i)

The frequency for periodic testing of the heat detectors associated with the automatic release system provided for fire door FDR-30-CB, is based on the requirements of NFPA 72-1996. This test does not need to DEMONSTRATE that the fire door release mechanism actuates upon a simulated actuation signal because this DEMONSTRATION is performed per TRS 3.7.A.7.3

REFERENCES:

1. FSAR 9.6.2
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3.7.A.7 CO₂ Fire Protection System

TRO 3.7.A.7 As a minimum, one CO₂ Storage Tank shall be available with a minimum level of 60% and a minimum pressure of 275 psi and the CO₂ System Fire Protection available to supply the CO₂ areas as listed in AP-64.1.

APPLICABILITY: Whenever equipment in these areas are required to be OPERABLE.

NOTES

1. Separate Condition entries are allowed.
2. TRO 3.0.C is not applicable.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. CO ₂ Storage Tank inoperable <u>OR</u> CO ₂ Fire Protection System unavailable	A.1.1 Establish a continuous fire watch and backup fire suppression equipment for the accessible unprotected area(s), <u>OR</u>	1 hour
	A.1.2.1 For the diesel generator room(s) only, VERIFY fire detectors in the affected room(s) are OPERABLE, <u>AND</u>	1 hour
	A.1.2.2 VERIFY the fire barriers between the affected room(s) and adjacent diesel generator room(s) and between the affected room(s) and the Control Building are OPERABLE, <u>AND</u>	1 hour
	A.1.2.3 VERIFY the diesel generator room sprinkler system in the affected room(s) are operable, <u>AND</u>	1 hour
	A.1.2.4 Establish an hourly fire watch patrol with backup fire suppression equipment for the affected diesel generator room(s). <u>AND</u>	1 hour
	A.2 Restore CO ₂ Fire Protection System equipment to OPERABLE status.	14 days
B. Required Action and Completion Time of A.2 is not met.	B. Submit a Special Report to the OSRC in accordance with specification 5.4.B.	30 days

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
TRS 3.7.A.7.1	DEMONSTRATE availability of CO ₂ Supply Units 3-1 or 3-2 for that unit which is lined up to the Control and Diesel Generator Buildings by visual observation of level and pressure indication for associated tank.	7 days
TRS 3.7.A.7.2	DEMONSTRATE that each valve (manual, power operated or automatic) in the flow path is in its correct position.	31 days
TRS 3.7.A.7.3	System Functional Test: (i) DEMONSTRATE that system valves and associated ventilation dampers and fire door release mechanisms actuate upon receipt of a simulated actuation signal. (ii) Exercise fire dampers.	(i) 24 months (ii) 12 months
TRS 3.7.A.7.4	DEMONSTRATE flow from nozzles.	24 months

BASES

BACKGROUND

These Technical Requirements are established to assure the operability and provide surveillance requirements of fire protection and detection systems provided to protect equipment utilized for safe shutdown of the unit.

APPLICABLE SAFETY ANALYSIS

The fire protection and detection systems installed at IP3, conform to Appendix A of Branch Technical Position (BTP) APCSB 9.5-1 "Fire Protection for Nuclear Power Plants", as approved by the NRC Regulatory Staff on March 6, 1979 as Amendment No. 24 to facility operating license No. DPR-64, and supplements thereto.

NSE 97-3-302-FP-CO₂, Rev. 0, allows an hourly fire watch patrol in lieu of a continuous fire watch in the emergency diesel generator compartment(s) when its CO₂ fire protection system is unavailable with its fire barriers, sprinkler system and detection system meeting certain requirements. If its sprinkler system, barriers or detection system becomes degraded below these requirements then TRO 3.7.A.2, 3.7.A.3, and 3.7.A.4, respectively, require establishing a continuous fire watch for the affected diesel compartment(s).

NSE 97-3-400FP CO₂, Rev.1, evaluates the use of dry air as an alternate test medium to CO₂ during functional testing of the CO₂ Fire Protection System.

NSE 97-3-424-FP-CO₂, Rev. 2, evaluates the use of administrative controls during periodic functional testing of the CO₂ system to ensure the support function of ventilation to the EDG is maintained ensuring continued operability of the EDG throughout the test. Implicit in the definition of operability of the EDGs, is the assumption that the associated ventilation systems that are required to maintain the room temperature below its design or limiting equipment qualification temperature, are also be capable of performing their function. These administrative controls are defined below in BASES Surveillance section.

NSE 98-03-048 FP CO₂, Revision 0 recognized that, under specific conditions, it may be necessary to isolate CO₂ storage tank 3-2 to correct deficiencies associated with one or more of the supplied systems. The NSE evaluated the effect on the operating mode (i.e., automatic versus manual) of the CO₂ fire suppression systems provided for the main boiler feed pumps and concluded that the backup fire protection provides an acceptable level of protection until the tank valve is re-opened. The NSE specifically considered backup fire suppression (i.e., a manual water spray system or standpipe system); automatic fire detection (i.e., heat detectors or heat responsive automatic sprinklers) and a 24-hour staffed on site fire brigade.

TRO

The CO₂ system fire protection availability by definition shall be interpreted to mean with the system in either the automatic or the manual mode of operation with the automatic mode as the primary mode of operation.

ACTIONS

A.1.1

Continuous fire watch means an individual is, without interruption, physically located in the unprotected area(s), (i.e., the area(s) lacking CO₂ fire protection). Using a roving watch with other, concurrent responsibilities would not be satisfactory compensatory action. With the CO₂ fire protection system out of service for the entire control building, three fire watches would be needed: 1) in the cable spreading room, 2) in the switch gear room, and 3) in the diesel generator building (the three diesel cells are contiguous in one fire area and have additional fire water protection). NSE 97-3-400FP CO₂, Rev.1, evaluated that during CO₂ functional testing, the continuous fire watch will remain in place unless occupying the Control Building poses an undue risk to personnel safety. In which case the continuous fire watch(es) will be temporarily relieved of their post(s) until the conditions of the building will allow re-entry.

A.1.2

Absent the availability of CO₂ fire protection system in the Diesel Generator Building, fire detectors of the heat detection systems, the automatic water spray systems and fire walls between adjacent diesel generator rooms and from the Control Building, coupled with compensatory action in the form of an hourly fire watch patrol and backup fire suppression equipment will provide reasonable assurance that a fire will be promptly detected and will ensure that the material condition of the rooms are maintained consistent with the administrative controls established under the IP3 Fire Protection Program. This will provide reasonable assurance that if a fire gets started, fire damage would be limited to a single diesel generator room by means of the automatic water spray system or manual action by the on-site fire brigade. As such, the verification that the fire detectors in the affected room and the fire walls between the affected room and adjacent diesel generator rooms are operable, coupled with an operable water spray system within the diesel generator sump and above the day tank provides reasonable justification to allow for an hourly fire watch patrol in lieu of a continuous fire watch when a Diesel Generator Building CO₂ fire protection system is unavailable.

SURVEILLANCE

Administrative controls are allowed during CO₂ functional testing to maintain the ventilation system support function available with manual action ensuring continued EDG operability. During testing, the thermostatic controls of the associated exhaust fans will be defeated such that the fans cannot automatically start on high ambient room temperature. Since the actuation circuit of the CO₂ system results in the cell intake air/smoke dampers to close, manual action is credited to reopen these dampers and restore EDG cell ventilation upon an EDG automatic start. The controls consist of a

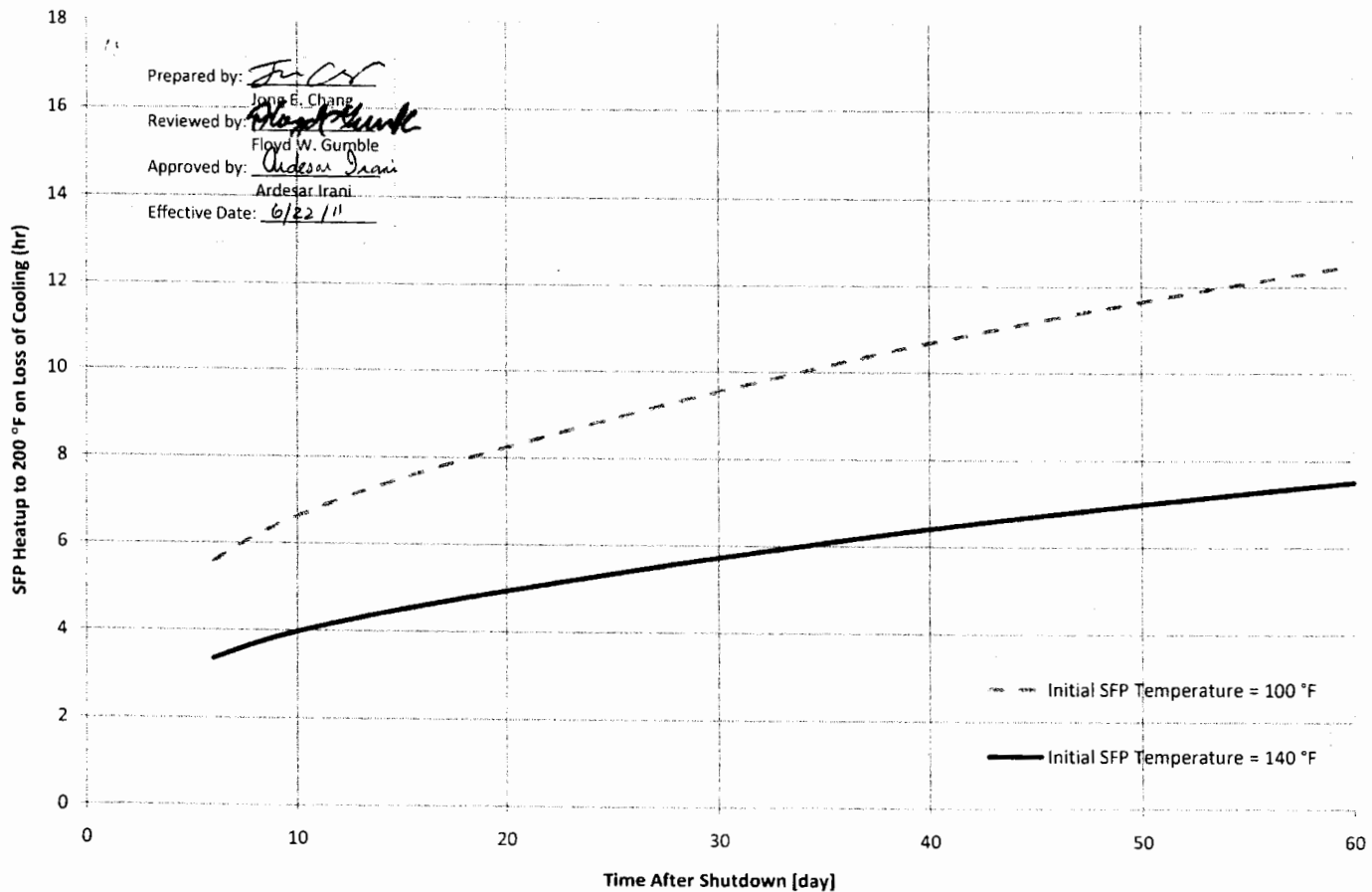
dedicated person located in the EDG cell, or in an adjacent room with the door between the two cells open, to first manually restore the open position of the smoke damper located on the 15' elevation, then to reposition the control switch for one of the two exhaust fans to start, and lastly manually restore the open position of the smoke damper located in the crawl space below the 15' elevation. These actions to restore ventilation shall be proceduralized in the test and reviewed as part of the pre-test briefing along with the location of equipment, access through crawl space for the second smoke damper and the equipment necessary to access and hold open the smoke dampers (i.e., a hand-held flashlight and utilizing approved qualified smoke damper open devices, such as un-fused electrical thermo links (ETL). Reference 3.

REFERENCES:

- 1) NSE 97-3-302-FP-CO₂, Rev. 0, "Change in the Compensatory Action in the Event of a CO₂ Fire Protection System of the Diesel Generator Building is Unavailable."
 - 2) NSE 97-3-400-FP-CO₂, Rev. 1, "Installation of a Seismic Control Panel for the 480V Switchgear Room and Cable Spreading Room CO₂ Systems."
 - 3) NSE 97-3-424-FP-CO₂, Rev. 2, "Installation of Seismic Control Panels for the EDG Cell CO₂ Systems and Supporting System Improvements."
 - 4) NSE 98-3-048-FP CO₂, Rev. 0, "Operation of the Plant with an Inoperable CO₂ Fire Suppression System for the Main Boiler Feed Pumps."
 - 5) FSAR 9.6.2
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3-GRAPH-ACS-1F, Rev. 0

SFP Heatup to 200 °F on Loss of Cooling -- Full-Core Discharge



**Attachment 1
SFP Heatup to 200°F**

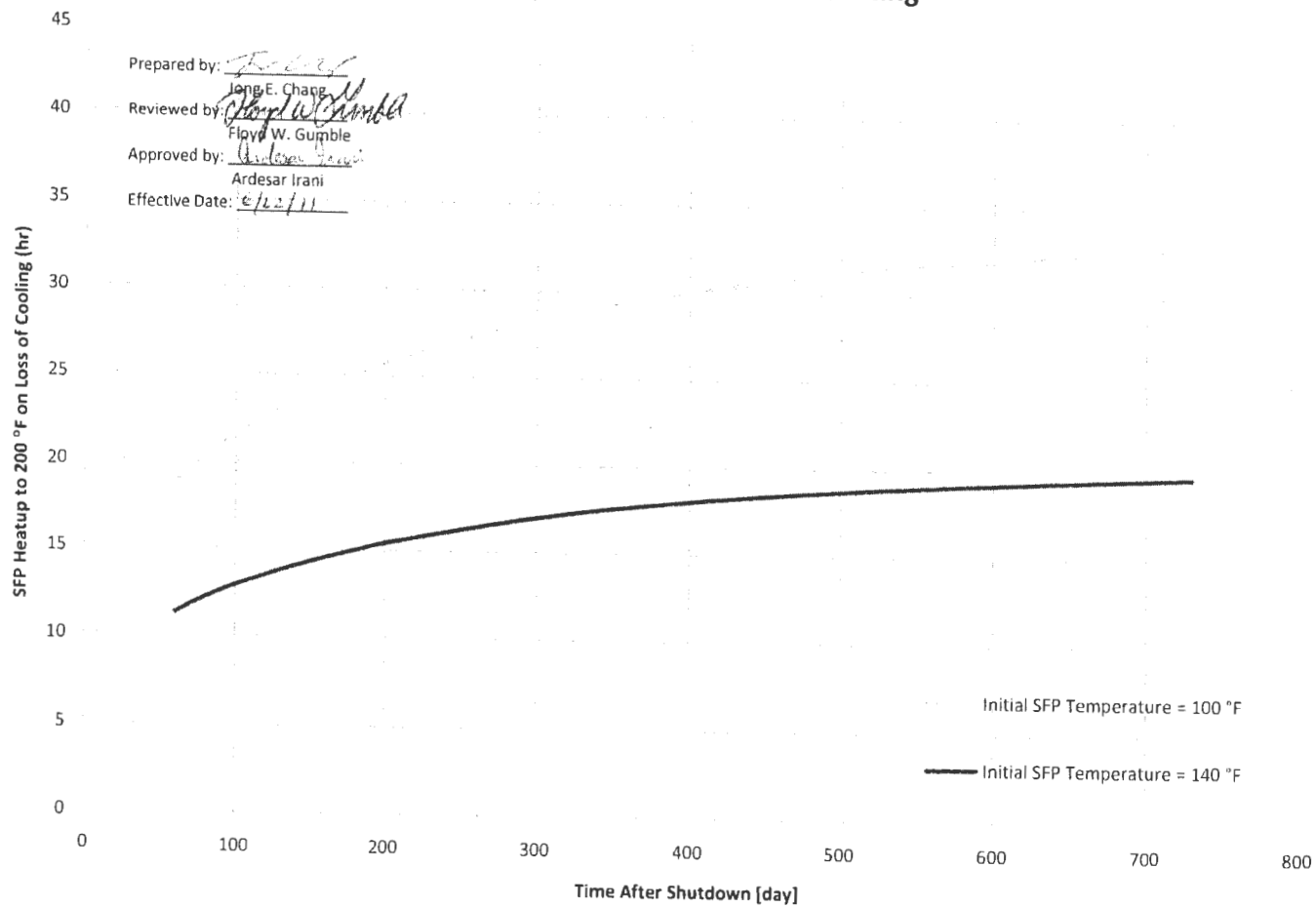
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SFP Heatup to 200 °F on Loss of Cooling



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