



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

August 26, 2013
NOC-AE-13003027
10 CFR 50.54(f)

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 & 2
Docket Nos. STN 50-498, STN 50-499
STPNOC First Six-Month Status Report in Response to March 12, 2012 Commission Order
Modifying Licenses with Regard to Requirements for Mitigation Strategies
For Beyond-Design-Basis External Events (Order Number EA-12-049)

- References:
1. NRC Order Number EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events dated March 12, 2012. (ML12073A195)
 2. NRC Interim Staff Guidance JLD-ISG-2012-01, "Compliance with Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," Revision 0, dated August 29, 2012. (ML12233A042)
 3. NEI 12-06, "Diverse and Flexible Coping Strategies (FLEX) Implementation Guide," Revision 0, dated August, 2012.
 4. STPNOC Initial Status Report in Response to March 12, 2012, Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049), dated October 24, 2012. (ML12310A389) (NOC-AE-13002909)
 5. STPNOC Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049), dated February 28, 2013. (ML13070A011) (NOC-AE-13002963)

On March 12, 2012, the Nuclear Regulatory Commission (NRC) issued an order (Reference 1) to STP Nuclear Operating Company (STPNOC). Reference 1 was immediately effective and directs STPNOC to develop, implement, and maintain guidance and strategies to maintain or restore core cooling, containment, and spent fuel pool cooling capabilities in the event of a beyond-design-basis external event. Specific requirements are outlined in Attachment 2 of Reference 1.

STI 33741664

A151
NRR

Reference 1 required submission of an initial status report 60 days following issuance of the final interim staff guidance (Reference 2) and an overall integrated plan pursuant to Section IV, Condition C of the order. Reference 2 endorses industry guidance document NEI 12-06, Revision 0 (Reference 3) with clarifications and exceptions identified in Reference 2. Reference 4 provided the STPNOC initial status report regarding mitigation strategies. Reference 5 provided the STPNOC overall integrated plan.

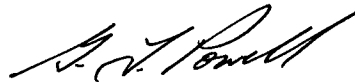
Reference 1 requires submission of a status report at six-month intervals following submittal of the overall integrated plan. Reference 3 provides direction regarding the content of the status reports. The purpose of this letter is to provide the first six-month status report pursuant to Section IV, Condition C.2, of Reference 1, that delineates progress made in implementing the requirements of Reference 1. The Enclosure to this letter provides an update of milestone accomplishments since the last status report, including any changes to the compliance method, schedule, or need for relief and the basis, if any.

This letter contains no new regulatory commitments.

If there are any questions regarding this letter, please contact Jim Morris at (361) 972-8652.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on: August 26, 2013



G. T. Powell
Site Vice President

Enclosure: STP Nuclear Operating Company (STPNOC) First Six Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

kjt

cc:
(paper copy)

(electronic copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
1600 East Lamar Boulevard
Arlington, TX 76011-4511

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Balwant K. Singal
U. S. Nuclear Regulatory Commission

Balwant K. Singal
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8 B1)
11555 Rockville Pike
Rockville, MD 20852

John Ragan
Chris O'Hara
Jim von Suskil
NRG South Texas LP

Senior Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

Kevin Pollo
Richard Pena
City Public Service

C. M. Canady
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Peter Nemeth
Crain Caton & James, P.C.

C. Mele
City of Austin

Eric Leeds
Director, Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
One White Flint North (MS 13 H 16M)
11555 Rockville Pike
Rockville, MD 20852

Richard A. Ratliff
Texas Department of State Health
Services

Robert Free
Texas Department of State Health
Services

Enclosure

STP Nuclear Operating Company (STPNOC) First Six Month Status Report for the Implementation of Order EA-12-049, Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events

1. Introduction

STPNOC developed an Overall Integrated Plan (OIP) (Reference 1 in Section 8), documenting the diverse and flexible strategies (FLEX), in response to Reference 2. This enclosure provides an update of milestone accomplishments since submittal of the OIP, including any changes to the compliance method, schedule, or need for relief/relaxation and the basis, if any. Because several changes have occurred to the OIP, the following is an overview of current basic mitigating strategies for the South Texas Project (STP) facility to meet the order.

NOTES:

1. All flow rates and pressures are approximate.
 2. The description of the following FLEX equipment is provided in each unit, unless otherwise noted.
- FLEX POWER – Two 480V AC, >500kw diesel generators (N & +1) will be staged on the Mechanical Auxiliary Building (MAB) roof in an enclosure that protects them from external hazards. A distribution switchgear will also be installed inside this enclosure. This switchgear will power the electrical equipment used in the FLEX strategies (phase 2).
 - REACTOR COOLANT SYSTEM (RCS) INVENTORY – The N pump is the 35 gpm Chemical & Volume Control System (CVCS) Positive Displacement pump @ 3100 psig taking suction from either the Boric Acid Tanks (BATs) or the Refueling Water Storage Tank (RWST) and discharging into the CVCS seal injection line. The +1 pump is a 40 gpm pump @ 1600 psig pre-staged at the -21 foot elevation (EL.) of the Fuel Handling Building (FHB) in one of the Safety Injection (SI) pump bays. This pump will take suction from the RWST and will discharge into the SI line downstream of High Head SI Pump discharge motor-operated valve (MOV).
 - CORE COOLING (Modes 1-4) – The N pump is the Turbine Driven Auxiliary Feedwater (TDAFW) pump. The +1 pump is a pre-staged motor driven 300 gpm pump @ 500 psig that will take suction from the AFW Storage Tank (AFWST) and discharge into the AFW cross-connect header that feeds all four steam generators (SG). The +1 pump will be located on the 10 foot EL. of the Isolation Valve Cubicle (IVC) in one of the rooms where the electric-driven AFW pumps are located

- CORE COOLING (Modes 5 & 6 without SG to support RCS natural circulation cooling) – The N pump is a pre-staged 150 gpm @ 60 psig pump that will be located near the RCS Inventory pump at the -21 foot EL. of the FHB. The N pump will use the same suction and discharge paths as the RCS Inventory pump. The +1 pump will be a Boric Acid (BA) pump. The BA pump can deliver 140 gpm @ 180 psig. Preliminary analysis demonstrates that 140 gpm is sufficient to make up for primary boil-off rate based on the boil-off rate 30 hours after shutdown.
- SPENT FUEL POOL (SFP) MAKEUP & SPRAY – There are 3 different makeup means required in the guidance:
 - Using a normal plant makeup mode
 - Using hoses to the pool
 - Using the spray monitors to spray the pool
- The normal makeup mode will be using a Reactor Makeup Water (RMW) pump and opening FC-0048, the valve used to fill the SFP.
- The hose to the pool method will be a pre-staged 250 gpm @ 150 psig pump installed on the -21 foot EL. FHB. The pump discharge will be piped to the 68 foot level of the FHB. Hose fittings will be installed on the end of the pipe and hoses will be staged in the area. Hoses will be routed from this location to the SFP. This pump will take suction from the RWST.
- The spray method uses the pump described in the preceding bullet with hoses routed to the spray monitors on the south end of the SFP deck. The +1 spray strategy will use a trailer mounted diesel driven pump. STP will have two trailer mounted diesel driven pumps staged in buildings in the yard (one inside the Protected Area (PA) & one outside the PA on the east side of the Main Cooling Reservoir). These pumps will be stored in buildings that are separated so that any one external event would not destroy both pumps.
- WATER SUPPLIES
 - RCS Inventory – RWST and BA Storage tanks will be the primary tanks used for makeup to the RCS. Following depletion of these tanks, there will be sufficient water on the containment floor to use the containment sumps recirculation path to recirculate water using the RCS inventory pump from containment back to the RCS. The RWST can be filled with non-borated water from other tanks, basins, and main reservoirs using a trailer mounted diesel driven pump with the flow path entering the south side of the MAB and into the room where the RWST is located.

- Core Cooling (Modes 1-4) – The mitigating strategy calls for starting to fill the AFWST at approximately 30 hours into the Beyond-Design Basis Event. For external events other than the Design Basis (DB) flood from a Main Cooling Reservoir embankment breach, the AFWST will be re-filled using a diesel driven pump from the Regional Response Center (RRC) or using one of STP trailer mounted diesel driven pumps. The suction source for these pumps can be any one of a number of tanks, basins or the Ultimate Heat Sink (i.e., Essential Cooling Water Pond).

In the case of the DB flood, flood water level around the AFWST at approximately 30 hours into the event will be approximately 5 feet deep. For this situation, the Feedwater Deaerator located at a height above the top of the AFWST is the water source for refilling the AFWST. A planned modification to the Feedwater Deaerator will allow its water to be moved via a hose and gravity to the AFWST emergency fill connection located at the top of the tank.

- Core Cooling (shutdown) – The RWST and BA Storage tanks will be the primary tanks used to makeup to the RCS. Following depletion of these tanks, there will be sufficient water on the containment floor to use the containment sumps recirculation path to recirculate the water from containment back to the RCS. The RWST can be filled with non-borated water from other tanks, basins or site reservoirs using a trailer mounted diesel driven pump. The pump discharge will be via a flow path entering the south side of the MAB and going into the room where the RWST is located.
- SFP makeup & spray –
 - For normal makeup, the source is the RMW storage tank.
 - For makeup with hoses, the source is the RWST.
 - For makeup with spray, the source is the RWST with outside basins and tanks as backup.

2. Milestone Accomplishments

STP has no milestone accomplishments to discuss at this time.

3. Milestone Schedule Status

The following provides an update to Attachment 2 of the Overall Integrated Plan. It provides the activity status of each item, and whether the expected completion date has changed. The dates are planning dates subject to change as design and implementation details are developed.

The revised milestone target completion dates do not impact the order implementation date.

Milestone	Target Completion Date	Activity Status	Revised Target Completion Date
Submit 60 Day Status Report	Oct 2012	Complete	None
Submit Overall Integrated Plan	Feb 2013	Complete	None
Submit 6 Month Updates:			
Update 1	Aug 2013	Complete	None
Update 2	Feb 2014	Not Started	-
Update 3	Aug 2014	Not Started	-
Update 4	Feb 2015	Not Started	-
Update 5	Aug 2015	Not Started	-
Update 6	Feb 2016	Not Started	-
Update 7	Aug 2016	Not Started	-
FLEX Strategy Evaluation	Sept 2013	Started	-
Walk-throughs or Demonstrations	Dec 2014	Not started	-
Perform Staffing Analysis	Dec 2013	Not started	Dec 2014
Modifications:			
Modifications Evaluation	Sept 2013	Started	-
Unit 1 Design Engineering	Jan 2014	Not started	June 2014
Unit 1 Implementation Outage	Oct 2015	Not started	-
Unit 2 Design Engineering	Jan 2014	Started	Mar 2014
Unit 2 Implementation Outage	Apr 2015	Not started	-

Storage:

Storage Design Engineering	Sept 2013	Not started	July 2014
Storage Implementation	Apr 2015	Not started	-

FLEX Equipment:

Procure On-Site Equipment	Jan 2014	Not started	Apr 2014
Develop Strategies with RRC	Oct 2013	Started	Oct 2014

Procedures:

PWROG ¹ issues NSSS ² -specific guidelines	Apr 2015	Started	-
Create Site-Specific FSGs ³	Apr 2015	Started	-
Create Maintenance Procedures	May 2014	Not started	-

Training:

Develop Training Plan	May 2014	Not started	Jan 2015
Training Complete	Sept 2014	Not started	April 2015

Unit 1 FLEX Implementation Oct 2015 Started -

Unit 2 FLEX Implementation Apr 2015 Started -

Submit Completion Report - Not started Oct 2015

¹ PWROG – Pressurized Water Reactor Owner’s Group

² NSSS – Nuclear Steam Supply System

³ FSG – Functional Safety Guidelines

4. Changes to Compliance Method

SPECIFIC CHANGES TO THE OIP:

1. In the OIP submitted on 2/28/2013, STPNOC stated the following on page 4:

“Prior to the RWST water depleting, makeup to the tank will commence using the Reactor Makeup Water Storage Tank (RMWST) and the Boric Acid Tanks (BATS). The necessary pumps will be powered by the FLEX 480V generator.”

STP has changed this plan as follows:

When the RWST depletes, the RCS Fill pump will be aligned to take suction on the Emergency Core Cooling System sump inside containment. If necessary, the RWST can be filled with non-borated water from other tanks, basins, and main reservoirs using the trailer mounted diesel driven pump and entering the south side of the MAB through the RMW tank room and into the room where the RWST is located.

2. In the OIP submitted on 2/28/2013, STPNOC stated the following on page 5:

“Another pump is available for SFP spray. It is a large capacity diesel driven pump that will be stored in its deployment location or will come from the RRC. This diesel driven pump will use an available water source, of which there are many.”

STP has changed this plan as follows:

The pre-staged SFP fill pump used to fill the pool using hoses, in the event the RMW pump is unable to operate, will be sized such that it can support SFP spray. The +1 pump for spray will be a large capacity diesel driven pump. STP will have two trailer mounted diesel driven pumps staged in buildings in the yard (one inside the Protected Area (PA) & one outside the PA on the east side of the Main Cooling Reservoir).

This change revises the description of SFP fill and spray strategy discussed on page 41 of the OIP.

3. In the OIP submitted on 2/28/2013, STPNOC stated the following on page 5:

“The following is a list of FLEX equipment used in the phases 2 and 3 coping for all functions PER UNIT unless otherwise stated:...”

There are 25 pieces of equipment discussed in this section. STP is changing some of this equipment as follows:

- a. #1 – the 500 kW diesel generator will be rated for > 500 kW.
- b. #3 – the 480V SG feed pump rated at 400 psig at 300 gpm was considered the N Core Cooling pump. However, the strategy is changed to make the Turbine Driven AFW pump the N pump for the Core Cooling safety function.
- c. #4 – the +1 pump for core cooling was rated at 400 psig, but will now be rated for approximately 500 psig.

- d. #8 – the SFP fill pump was rated at 75 psig @ 200 gpm but now will be rated at approximately 150 psig @ 250 gpm and will be used for spray capability as well.
- e. #9 – one of the trailer mounted diesel driven pumps will be used as +1 for spray capability
- f. #10 – the other trailer mounted diesel driven pump will be used for various water supply needs in both Units instead of a +1 for spray.
- g. #11 – portable DC power will not be used for closing the SI Accumulator discharge valves, instead, the motors for these valves will be powered from the FLEX Diesel Generator (DG).
- h. #26 – a 480V Core Cooling (N) pump for shutdown modes with a capacity of approximately 150 gpm at approximately 60 psig is added as a new component to the list of FLEX equipment.
- i. #27 – the 480V CVCS Boric Acid pump (permanent plant equipment) for +1 for the Core Cooling pump for shutdown modes is added as a new component to the list of FLEX equipment.

4. In the OIP submitted on 2/28/2013, STP stated the following on page 13:

“Regarding Spent Fuel Pool spray capability, strategies exist to spray the pool as required by NEI 12-06 for all external outside design basis events. However, for a design basis flood, spray capability will not be available for approximately 72 hours (Ref.7) due to the flood waters at the site receding to ~ 1.5 ft at this time.”

The strategy associated with SFP spray has changed such that the primary (N) pump for SFP spray will be located inside the power block. As such, the statement regarding not having the ability to spray during a design basis flood is revised. The capability to initiate SFP spray under any external event will be available.

5. In the OIP submitted on 2/28/2013, STP stated the following on page 15:

“During Mode 5 and 6 prior to flood up, the FLEX SFP Fill pump (rated at 200 gpm) will be directed to discharge into the Safety Injection piping which is connected to the RCS.”

STPNOC has changed this strategy.

A new pump will be staged in the FHB that will be used specifically for cooling the core during shutdown modes. This Core Cooling pump for shutdown modes will be

rated for approximately 150 gpm @ approximately 60 psig and will take suction from the RWST. The +1 pump for this shutdown strategy will be a Boric Acid (BA) pump, taking suction on the BA tanks.

6. In the OIP submitted on 2/28/2013, STP stated the following on page 39:

“Regardless of what phase is being discussed, each pump (the RMW pump, the SFP fill pump and the large capacity diesel driven pump), tools and hoses will be staged in a design basis building (safety related structure).”

The storage location strategy of the trailer mounted large capacity diesel driven pumps has changed such that the pumps will not be stored in a safety-related structure, but instead will be stored in buildings separated by distance such that any single external event will not render both pumps unavailable.

7. The 480 VAC FLEX Diesel Generator Load List on page 61 of the OIP submitted on 2/28/2013 has horsepower ratings that are still being evaluated. As such, they may be revised in future submittals.
8. The current plan for SFP makeup is being developed. Some uncertainty exists on the required size of suction piping for the FLEX pump regarding increased discharge flow rate. Thus, no drawing will be submitted for NRC review at this time. However, by the next (2nd) 6 month update, the design should be complete and drawing revised.
9. The conceptual drawing for the 480V FLEX DG on page 69 of the OIP should also include power being provided to the SI Accumulator motor-operated discharge valves as discussed earlier in this enclosure. This drawing will be revised and provided with the next (2nd) 6 month update.
10. Different lighting panels have been selected to be powered that are described on page 71 of the OIP. Further review revealed a more preferred selection of lighting panels to be powered. As an example, the lighting panel that powers the Lossy Loop amplifiers for radio communications is now on the selected list. The drawing reflecting the selected lighting panels to be powered will be revised by the next (2nd) 6 month update.

5. Need for Relief/Relaxation and Basis for the Relief/Relaxation

STPNOC expects to comply with the order implementation date and no relief/relaxation is required at this time.

6. Open Items from Overall Integrated Plan and Draft Safety Evaluation

Below are the open items (OI) from the integrated plan submitted on February 28, 2013:

OI #1 – Portable DC power inverted to 480VAC still in design phase - STP needs further review to see if this strategy will be needed

Update: Item closed.

Revised strategy is to add cabling from the FLEX DG to each Engineered Safety Features (ESF) Switchgear room. This design will provide power to the SI accumulator discharge MOVs. At approximately 8 hours into the event, the FLEX DG is expected to be running & capable to supplying power for closing these MOVs. Thus, this strategy no longer depends on portable DC power.

OI #2 – Site specific analysis on time to RCS Reflux cooling to ensure STP does not allow water level low enough to enter that stage of core cooling and provides minimum mission times to deploy RCS makeup pumps

No update

OI #3 – Storage locations, protection and transportation for large diesel driven pumps TBD

Update: Item closed.

Two trailer mounted large capacity diesel driven pumps will be used for various strategies. One will be stored inside the PA in a building that is not protected from external events. The other pump will be stored over two miles away in a similar building. They are an adequate distance apart such that a single external event should not render both buildings unavailable. Each pump will be stored on a trailer. A vehicle to pull the trailer will be stored with each pump and trailer. Sufficient number of hoses will be stored with each pump to supply water over the distances needed from the water source to the destination point for the staging of the pump.

OI #4 – Administrative program governing FLEX implementation to be developed

No update

OI #5 – Fill connections TBD

No update

OI #6 – Complete GOTHIC analysis of RCB pressure and temperature during/after event

No update

OI #7 – Site specific analysis on return to criticality temperature with attention given to:

- SG FLEX feed pump sizing based on stabilizing at higher SG pressure
- RCS inventory analysis at higher target SG pressure with higher extended RCP seal leakage

No update

OI #8 – Site specific analysis on target cooldown temperature for SI accumulator injection or if any accumulator water will be utilized during the cooldown

No update

OI #9 – FLEX Support Guideline procedure work associated with:

- Use of the RRC
- Fuel oil strategy
- Filling SFP
- 125VDC plan (deep load shedding)
- Connecting power to the electrical FLEX equipment (e.g. hookup to breakers)
- FLEX implementing strategies
- Filling AFWST

No update

OI #10 - Store backup 480V generator on roof or at RRC – TBD

Update: Item closed.

The +1 diesel generator will be stored on the roof of the MAB.

OI #11 – Site specific analysis required for modes 5 and 6 RCS fill rate for heat removal and boron flushing.

No update

OI #12 – No longer applicable

Update: Item closed.

OI #13 - Provide calculation proving MAB can support additional weight of 480V FLEX generator(s), fuel tank, enclosure, etc.

No update

OI #14 – No longer applicable

Update: Item closed

OI #15 – Calculation on how much fuel the FLEX DG will use and how long will our stored capacity last

No update

OI #16 – Determine where STP's staging area will be located - Travel paths will be determined when staging area is determined

Update: The staging area for the RRC will be the Emergency Operations Facility (EOF) located approximately 20 miles from the STP site in Bay City, Texas. The backup staging area is still being determined. Travel paths are still being determined.

OI #17 – Determine where to make tie-ins into SI system for suction and discharge for RCS and SFP FLEX Fill pumps

No update

OI#18 – Determine instrumentation that will be specifically associated with the FLEX equipment (e.g. Fuel oil level for the FLEX DG fuel tank)

No update

OI#19 - As the flood and seismic re-evaluations are completed, appropriate issues will be entered into the corrective action program and addressed on a schedule commensurate with other licensing bases changes.

Update: Flood re-evaluation demonstrates that the STP Facility meets the current Design Basis. Seismic re-evaluation will not be complete until March of 2014.

OI#20 – Analysis showing that one large diesel driven pump can provide SFP spray to both units SFPs simultaneously

Update: Item closed.

An analysis is no longer required. The SFP spray strategy has changed such that one trailer mounted large capacity diesel driven pump will not be used to fill both Unit's SFPs. Each Unit will have a pre-staged pump to fill the SFP.

7. Potential Draft Safety Evaluation Impacts

There are no potential impacts to the Draft Safety Evaluation identified at this time.

8. References

The following references support the updates to the Overall Integrated Plan described in this attachment.

1. STPNOC's Overall Integrated Plan in Response to March 12, 2012 Commission Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events (Order Number EA-12-049)," dated February 28, 2013. (ML13070A011) (NOC-AE-13002963)
2. NRC Order Number EA-12-049, "Order Modifying Licenses with Regard to Requirements for Mitigation Strategies for Beyond-Design-Basis External Events," dated March 12, 2012. (ML12073A195)