1.10S Impacts of Construction

1.10S.1 Introduction

An assessment of the potential impacts of the construction of STP 3 & 4 on structures, systems, and components (SSCs) important to safety for STP 1 & 2 was performed in accordance with 10 CFR 52.79(a)(31). In addition, an assessment of potential impacts of construction of STP 4 on STP 3 when Unit 3 is operational was also performed.

These assessments involved several sequential steps:

- Identification of potential construction activity hazards
- Identification of SSCs important to safety and limiting conditions for operation (LCOs)
- Identification of potentially impacted SSCs and LCOs
- Identification of applicable managerial and administrative controls

1.10S.2 Potential Construction Activity Hazards

The STP 3 & 4 units will be located on the existing STP site in an area generally west and north of the two operating units, STP 1 & 2, as shown in Figure 1.10S-1. The power blocks for the two pairs of units have a minimum separation of approximately 800 feet at their closest point while the centroids for the two power block pairs are separated by approximately 2700 feet.

Construction activities include site exploration, grading, clearing, and installation of drainage and erosion-control measures; boring, drilling, dredging, demolition, and excavating; storage and warehousing of equipment; and construction, erection, and fabrication of new facilities. Construction impacts on security controls are discussed in COLA Part 8.

Based on the assessments discussed above, STP 3 & 4 construction activities and their representative hazards are shown in Table 1.10S-1.

1.10S.3 Impacted SSCs and LCOs

The construction activities described above were reviewed for possible impact to SSCs important to safety.

- STP 1 & 2 SSCs important to safety are described in Chapter 3 of the STP 1&2 Updated Final Safety Analysis Report (UFSAR)
- STP 3 SSCs important to safety are described in Chapter 3 of the STP 3 & 4 Final Safety Analysis Report and the reference ABWR DCD
- Limiting conditions of operation for STP 1 & 2 are located in the STP 1 & 2 Technical Specifications

- As indicated in Chapter 16, the limiting conditions of operation for STP 3 are located in Part 4 of the COLA

This assessment identified the SSCs that could reasonably be expected to be impacted by construction activities unless administrative and managerial controls are established at the site. The results of the assessment are presented in Table 1.10S-2.

1.10S.4 Managerial and Administrative Controls

Specific managerial and administrative controls have been identified in Table 1.10S-3 to eliminate or mitigate construction hazards that could impact SSCs important to safety. These managerial controls are considered by NINA and STPNOC to provide reasonable assurance of protecting the identified SSCs from construction hazards. In addition, these controls ensure that any associated LCOs specified in the applicable Unit's Technical Specifications are not exceeded as a result of construction activities based on the following discussion.

The majority of the SSCs important to safety are contained and protected within safety-related structures. The managerial controls established will protect these internal SSCs from postulated construction hazards by maintaining the integrity and design basis of the safety-related structures and foundations. Heavy load drop controls, crane boom failure standoff requirements, groundwater depression monitoring, ground vibration controls and construction generated missile(s) control are examples of managerial controls that would provide this reasonable assurance.

Other managerial controls will reasonably ensure that offsite power is not disrupted, hazardous materials and gasses are controlled, cooling water supplies are protected, instrumentation is protected from vibrations, and the SSCs are protected from site excavation issues. These managerial controls prevent or mitigate external construction impacts that could affect these SSCs. These controls also prevent or mitigate unnecessary challenges to safety systems caused by plant construction hazards, such as disruption of offsite transmission lines or impact to plant cooling water supplies~~ for example~~. Onsite construction activities with potential safety significance to the operating units will also be addressed in accordance with established NINA~~STPNOC~~ processes.

Table 1.10S-1 Potential Hazards from Construction Activities

Construction Activity Hazard	Potential Impact
Site Exploration, Grading, Clearing, Installation of Drainage and Erosion Control Measures	Overhead Power Lines
	Transmission Towers
	Underground Conduits, Piping, Tunnels, etc.
	Site Access and Egress
	Drainage Facilities and Structures
	Onsite Transportation Routes
	Slope Stability
	Soil Erosion and Local Flooding
	Construction-Generated Dust and Equipment Exhausts
	Encroachment on Plant Control Boundaries
	Encroachment on Structures and Facilities
Boring, Drilling, Pile Driving, Dredging, Demolition, Excavation	Underground Conduits, Piping, Tunnels
	Foundation Integrity
	Structural Integrity
	Slope Stability
	Erosion and Turbidity Control
	Groundwater and Groundwater Monitoring Facilities
	Dewatering Structures, Systems and Components
	Adjacent or Nearby Structures, Systems and Components
	Vibratory Ground Motion
Equipment Movement, Material Delivery, Vehicle Traffic	Overhead Power Lines
	Transmission Towers
	Underground Conduits, Piping, Tunnels, etc.
	Crane Load Drops
	Crane or Crane Boom Failures
	Vehicle Accidents
	Rail Car Derailments
	Equipment Delivery and Heavy Equipment Delivery
Equipment and Material Laydown, Storage, Warehousing	Releases of Stored Flammable, Hazardous or Toxic Materials
	Wind-Generated, Construction-Related Debris and Missiles

Table 1.10S-1 Potential Hazards from Construction Activities (Continued)

Construction Activity Hazard	Potential Impact
General Construction, Erection, Fabrication	Physical Integrity of Structures, Systems and Components
	Adjacent or Nearby Structures, Systems and Components
	Instrumentation and Control Systems and Components
	Electrical Systems and Components
	Cooling Water Systems and Components
	Decay Heat Removal Structures, Systems and Components
	Radioactive Waste Release Points and Parameters
	Abandonment of Structures, Systems or Components
	Relocation of Structures, Systems or Components
	Removal of Structures, Systems or Components
Shared System(s) Tie-ins and Connection(s)	Instrumentation and Control Systems and Components
	Electrical Systems and Components
	Water Systems and Components
Equipment and Material Laydown, Storage, Warehousing	Flooding Design Basis/Flood Protection Measures for STP Units 1 & 2
General Construction, Erection, Fabrication	Flooding Design Basis/Flood Protection Measures for STP Units 1 & 2

Table 1.10S-2 Hazards During Construction Activies

Potential Impact Hazard	Impacted SSCs
Impact on Overhead Power Lines	Offsite Power System
Impact on Transmission Towers	Offsite Power Systems
Impact on Utilities, Underground Conduits, Piping, Tunnels, Tanks	Fire Protection System Service Water System Ultimate Heat Sink
Impact of Construction-Generated Dust and Equipment Exhausts	Electrical Auxiliary Building (EAB), Technical Support Center (TSC) and Control Room Emergency HVAC Systems Diesel Generators
Impact of Vibratory Ground Motion	Offsite Power System Onsite Power Systems Instrumentation and Seismic Monitors
Impact of Crane or Crane Boom Failures Impact of Crane Load drops	Safety Related and Important to Safety Structures and Foundations
Impact of Releases of Flammable, Hazardous or Toxic Materials	EAB, TSC and Control Room Emergency HVAC Systems
Impact of Wind-Generated, Construction-Related Debris and Missiles	Safety-Related and Important to Safety Structures EAB, TSC and Control Room Emergency HVAC Common Air Intake
Impact on Electrical Systems and Components	Offsite Power System Onsite Power Systems
Impact on Cooling Water Systems and Components	Service Water System Ultimate Heat Sink
Impact on Radioactive Waste Release Points and Parameters	Gaseous and Liquid Radioactive Waste Management Systems
Impact of Relocation of Structures, Systems or Components	Fire Protection System Service Water System
Impact of Site Groundwater Depression and Dewatering SSCs Impact of Groundwater and Groundwater Monitoring Facilities	Safety-Related and Important to Safety Structures and Foundations
Impact of Equipment Delivery and Heavy Equipment Delivery	Safety-Related and Important to Safety Structures and Foundations
Impact on Drainage Facilities and Structures	Safety-Related and Important to Safety SSCs
Impact on Site Access and Egress	Plant Control Boundaries Plant Structures and Facilities
Impact on Onsite Transportation Routes	Not Applicable [1]
Impact on Slope Stability	Not Applicable [1]
Impact on Soil Erosion and Local Flooding	Safety-Related SSCs and SSCs Important to Safety

Table 1.10S-2 Hazards During Construction Activies (Continued)

Potential Impact Hazard	Impacted SSCs
Impact on Erosion and Turbidity Control	Not Applicable [1]
Impact of Encroachment on Plant Control Boundaries	Not Applicable [1]
Impact of Encroachment on Structures and Facilities	Safety-Related SSCs and SSCs Important to Safety
Impact on Foundation Integrity	Safety-Related Foundations and Foundations Important to Safety
Impact on Structural Integrity	Safety-Related SSCs and SSCs Important to Safety
Impact on Adjacent and Nearby Structures, Systems and Components	Safety-Related SSCs and SSCs Important to Safety
Impact on Physical Integrity of Structures, Systems and Components	Safety-Related SSCs and SSCs Important to Safety
Impact of Abandonment of Structures, Systems and Components	Not Applicable [1]
Impact of Removal of Structures, Systems and Components	Not Applicable [1]
Impact on Instrumentation and Control Systems and components	Safety-Related SSCs and SSCs Important to Safety
Impact on Decay Heat Removal Structures, Systems and Components	Service Water System Ultimate heat Sink
Impact of Vehicle Accidents	Safety-Related SSCs and SSCs Important to Safety
Impact of Rail Car Derailments	Safety-Related SSCs and SSCs Important to Safety
Impact of Shared System(s) Tie-ins and Connections	Fire Protection System and Components Makeup Water Preparation System [1] Communications [1]
Impact on Flooding Design Basis/Flood Protection Measures for STP Units 1 & 2	Not Applicable [1]

[1]SSCs with LCOs are not impacted.

Table 1.10S-3 Managerial and Administrative Construction Controls

Construction Hazards to SSCs	Managerial Control
Impact on Transmission Power Lines and Offsite Power Lines	Safe standoff clearance distances will be established for the existing transmission power lines. Construction Engineering to verify standoff distance for all large modules, the reactor vessel and large equipment to be transported beneath energized electric lines to meet minimum standoff clearance requirements. Administrative procedure controls will be implemented to require compliance. Physical warning or caution barriers and signage will be erected along transport routes.
Impact on Transmission Towers	Administrative procedure controls will be implemented to avoid equipment collisions with electric transmission support towers. Physical warning or caution barriers and signage will be erected to protect electric transmission support towers. Engineering analyses will be performed should pre-job review indicate that safe standoff distances may be encroached upon.
Impact on Utilities, Underground Conduits, Piping, Tunnels, Tanks	Administrative procedure controls for grading, excavation and pile driving will be developed requiring the location and identification of equipment or underground structures that must be relocated, removed, or left in place and protected prior to the work activity.
Impact of Construction-Generated Dust and Equipment Exhausts	Construction environmental controls will be implemented to control fugitive dust and dust generation. Potentially affected system air intakes and filters will be periodically monitored to ensure limits are not exceeded.
Impact of Vibratory Ground Motion Impact on Instrumentation and Control Systems and Components	Construction administrative procedures, methods, and controls will be implemented to ensure ground vibration and instrumentation limit settings are not exceeded.

Table 1.10S-3 Managerial and Administrative Construction Controls (Continued)

Construction Hazards to SSCs	Managerial Control
Impact of Crane or Crane Boom Failures Impact of Crane Load Drops Impact on Instrumentation and Control Systems and Components Impact on Foundation Integrity Impact on Structural Integrity	Construction standoff distance controls will be implemented to prevent heavy load impacts upon SSCs from crane boom failures and crane load drops. Drop analyses will be performed should pre-job review indicate that standoff distances may be encroached upon.
Impact of Shared System Tie-ins and Connections between STP 3 & 4 Impact on Instrumentation and Control Systems and Components Impact on Electrical Systems and Components Impact on Water Systems	Construction controls for tie-ins and interconnections into operating Unit 3 systems will be established by engineering and approved by the STP 3 Operations Department STP 4 construction work packages and instructions for tie-ins and interconnections with STP 3 (shared) systems will be prepared, reviewed and approved in accordance with engineering requirements and STP 3 Operations Department requirements and procedures. A pre-job review will be conducted by engineering prior to performing tie-in or interconnection work. STP 4 construction work packages for system tie-in and interconnection with STP 3 (shared systems) require authorization to start work from the STP 3 control room shift manager or other designated STP 3 Operations Department official.
Impact of Releases of Flammable, Hazardous or Toxic Materials and Missile Generation	Engineering and construction environmental, safety and health controls will limit transport, storage, quantities, type and use of flammable, hazardous, toxic materials and compressed gasses to assure that the control room envelope air intake design bases are maintained. Construction safety and storage controls will assure that missile generation events from compressed gasses are within the design basis.
Impact of Wind-Generated, Construction-Related Debris and Missiles	Construction procedure controls will address equipment, material storage and transport during high winds or high wind warnings. Existing plant procedures will be followed during severe weather conditions which may call for power reduction or shut down.

Table 1.10S-3 Managerial and Administrative Construction Controls (Continued)

Construction Hazards to SSCs	Managerial Control
Impact on Electrical Systems and Components Impact on Instrumentation and Control (I&C) Systems and Components	Engineering analysis will identify any STP 1 & 2 electrical systems and components, and any I&C systems and components within or near the STP 3 & 4 construction area. These items will be isolated and relocated to within the STP 1 & 2 area in accordance with engineering requirements and STP 1 & 2 Operations Department instructions and requirements as applicable. Construction administrative procedures will provide protective controls established by engineering and approved by the STP 1 & 2 Operations Department as applicable for any STP 1 & 2 electrical or I & C systems and components which cannot be moved. Engineering analysis will identify any STP 3 electrical systems and components and I&C systems and components within or near the STP 4 construction area. These items will be isolated and relocated to within the STP 3 area in accordance with engineering requirements and STP 3 Operations Department instructions and requirements. Construction administrative procedures will provide protective controls established by engineering and approved by the STP 3 Operations Department as applicable for any STP 3 electrical systems and components and I&C systems and components which cannot be moved.
Impact on Cooling Water Systems and Components Impact on Decay Heat Removal SSCs	Transport of heavy load equipment over buried cooling water piping will be prohibited without an engineering evaluation. Physical warning, standoff distances or caution barriers and signage will be erected.
Impact on Cooling Water Systems and Components Impact on Decay Heat Removal SSCs	Transport of heavy load equipment over buried cooling water piping will be prohibited without an engineering evaluation. Physical warning, standoff distances or caution barriers and signage will be erected.
Impact on Radioactive Waste Release Points and Parameters	Engineering evaluation and managerial controls will be implemented, as necessary, to ensure there is no construction activity which could cause radioactive releases beyond the established limits.

Table 1.10S-3 Managerial and Administrative Construction Controls (Continued)

Construction Hazards to SSCs	Managerial Control
Impact of Relocation of Structures, Systems or Components	Engineering pre-job review will identify SSCs that require relocation and temporary or permanent design changes will be implemented, if required.
Impact of Site Groundwater Depression and Dewatering Impact on Foundation Integrity Impact on Structural Integrity	Engineering controls will be implemented to maintain groundwater depression within limits to protect important safety structures and foundations.
Impact on Drainage Facilities and Structures	Physical warning or caution barriers and signage will be erected to protect drainage facilities and structures. Engineering analyses will be performed should pre-job review indicate that safe standoff distances may be encroached upon.
Impact on Soil Erosion and Local Flooding	Engineering Controls will be implemented to assure that the site flooding design basis is maintained for the operating units during construction activities that may alter site drainage requirements. Soil erosion control measures will be implemented to assure site drainage requirements are not impacted.
Impact of Encroachment on Structures and Facilities Impact on Adjacent or Nearby Structures, Systems and Components Impact on Physical Integrity of SSCs	Pre-job reviews will be performed to identify construction encroachment impact upon nearby operating unit SSCs and facilities. Engineering controls will be implemented as required to protect the identified SSCs and facilities.

Table 1.10S-3 Managerial and Administrative Construction Controls (Continued)

Construction Hazards to SSCs	Managerial Control
Impact of Equipment Delivery, Heavy Equipment Delivery, and Vehicular Traffic Impact on Safety Related Structures and Foundations Impact of Vehicle Accidents Impact of Rail Car Derailments	Engineering controls will be implemented to establish rail transport speed limit and maximum rail loading weights onsite. General equipment and heavy equipment movement controls, limitations, and vehicular speed limits will be established by Engineering.
Impact on Site Access and Egress	Plant signage will be erected to identify construction worker access and egress routes and to direct construction deliveries. Construction equipment orders will include delivery location instructions. Plant signage will be modified as necessary to direct operating plant worker access and egress routes. Operating plant equipment orders will include delivery location instructions.

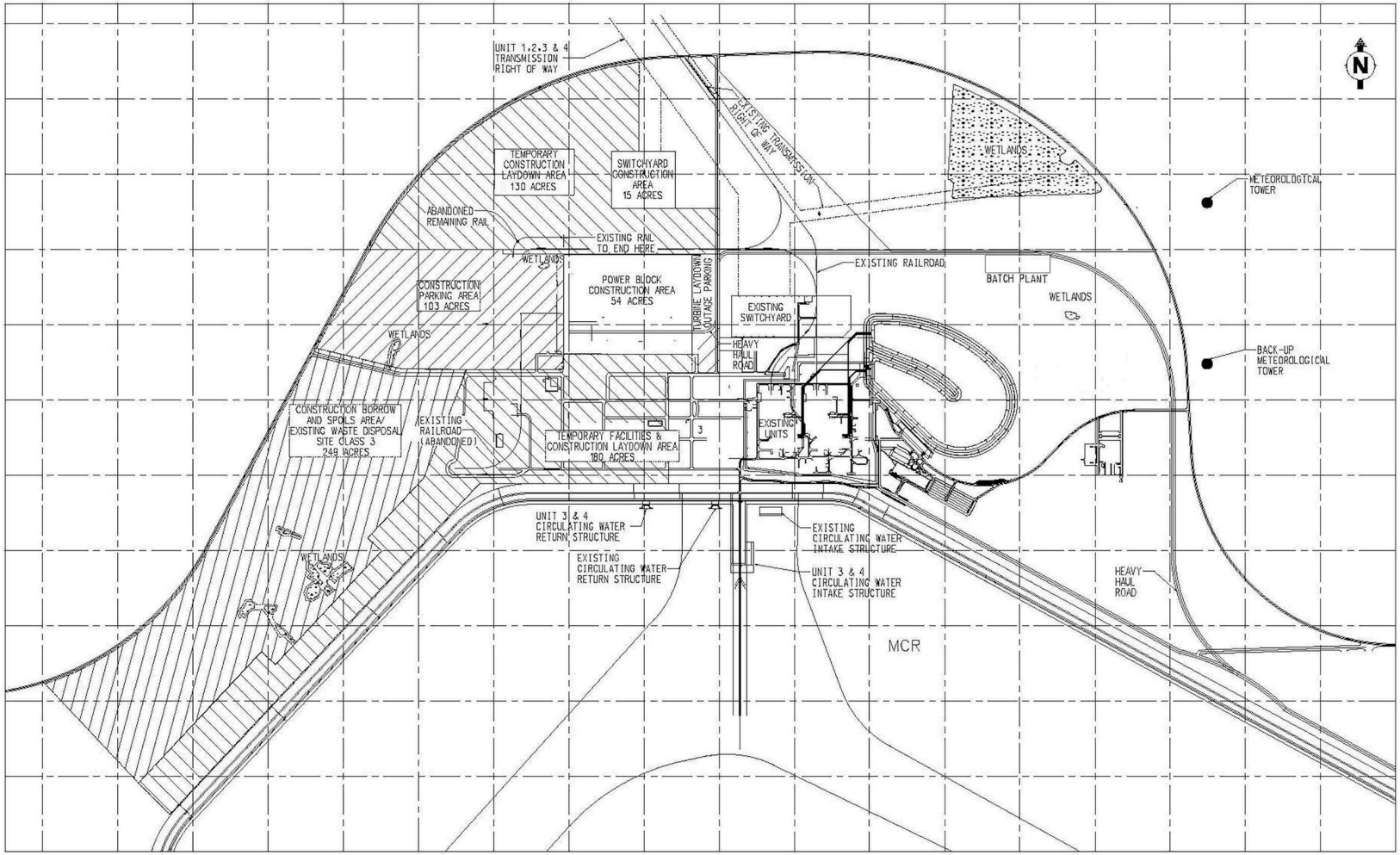

Figure 1.10S-1 Construction Facilities Plan