

March 16, 2011

SBK-L-11044 Docket No. 50-443

U.S. Nuclear Regulatory Commission Attention: Document Control Desk One White Flint North 11555 Rockville Pike Rockville, MD 20852

Seabrook Station

Response to Request for Additional Information NextEra Energy Seabrook License Renewal Environmental Report

References:

- 1. NextEra Energy Seabrook, LLC letter SBK-L-10077, "Seabrook Station Application for Renewed Operating License," May 25, 2010. (Accession Number ML101590099)
- NRC Letter "Request for Additional Information for the Review of the Seabrook Station License Renewal Application Environmental Review (TAC NO. ME3959)" October 29, 2010 (Accession Number ML102861217)
- 3. NextEra Energy Seabrook, LLC letter SBK-L-10185, "Response to Request for Additional Information NextEra Energy Seabrook License Renewal Environmental Report," November 23, 2010. (Accession Number ML103350639)
- 4. NextEra Energy Seabrook, LLC letter SBK-L-10190, "Response to Request for Additional Information Submittal of Cultural Resource Plan In Accordance with 36 CFR 800.11(c)" November 23, 2010. (Accession Number ML103280392)

In Reference 1, NextEra Energy Seabrook, LLC (NextEra) submitted an application for a renewed facility operating license for Seabrook Station Unit 1 in accordance with the Code of Federal Regulations, Title 10, Parts 50, 51, and 54.

In Reference 2, the NRC requested additional information in order to complete its review of the License Renewal Application Environmental Report including draft and final copies (when available) of Cultural Resources Protection Plan implementing procedures. In Reference 3, NextEra provided draft copies of procedures related to Cultural Resources Protection Plan submitted with Reference 4. Enclosed is the initial issue of implementing procedures related to the Cultural Resources Protection Plan. No new or revised commitments are made in this submittal.

If there are any questions or additional information is needed, please contact Mr. Richard R.Cliche, License Renewal Project Manager, at (603) 773-7003.

If you have any questions regarding this correspondence, please contact Mr. Michael O'Keefe, Licensing Manager, at (603) 773-7745.

Sincerely,

NextEra Energy Seabrook, LLC.

Paul Freeman Site Vice President

United States Nuclear Regulatory Commission SBK-L-11044 / Page 3

Enclosure

cc:

W.M. Dean,	NRC Region I Administrator
G. E. Miller,	NRC Project Manager, Project Directorate I-2
W. J. Raymond,	NRC Resident Inspector
R. A. Plasse Jr.,	NRC Project Manager, License Renewal
M. Wentzel,	NRC Project Manager, License Renewal

Mr. Christopher M. Pope

Director Homeland Security and Emergency Management New Hampshire Department of Safety Division of Homeland Security and Emergency Management Bureau of Emergency Management 33 Hazen Drive Concord, NH 03305

John Giarrusso, Jr.

Nuclear Preparedness Manager The Commonwealth of Massachusetts Emergency Management Agency 400 Worcester Road Framingham, MA 01702-5399 United States Nuclear Regulatory Commission SBK-L-11044



I, Paul O. Freeman, Site Vice President of NextEra Energy Seabrook, LLC hereby affirm that the information and statements contained within are based on facts and circumstances which are true and accurate to the best of my knowledge and belief.

Sworn and Subscribed

Before me this

<u>/6 th</u> day of <u>March</u>, 2011

Paul O. Freeman Site Vice President

reley Sweeren

Notary Public



Enclosure to SBK-L-11044

NextEra Energy Seabrook, LLC

Cultural Resource Protection Plan Implementing Procedures

- Environmental Compliance Manual Procedure 6.1 Revision 00
- Seabrook Station Administrative Procedure SH 6.4 "Dig Safe" Revision 12

1.0 CULTURAL RESOURCES PROTECTION PLAN

1.1 Background

The National Historic Preservation Act (NHPA) requires federal agencies to consider the effects on archaeologically and historically significant cultural resources prior to issuing a permit or license or amendment thereto. Amendments to the Seabrook Station Operating License may be subject to NHPA consultation with federal or state agencies responsible for cultural resource protection. Of particular interest would be those involving ground-disturbing activities.

Most ground-disturbing activities at Seabrook Station which could impact archaeological, cultural and/or historic resources do not require an Operating License amendment and so would not be a federal undertaking triggering NHPA requirements. NextEra Energy Seabrook shall evaluate these undertakings to assure the protection of archaeologically and historically significant cultural resources. This Cultural Resource Protection Plan (CRPP) describes the actions NextEra Energy Seabrook has taken and shall take to enhance the protection of archaeological, cultural and historic resources at Seabrook Station.

1.2 Purpose

The purpose of this plan is to support the mission of the New Hampshire Division of Historical Resources (NHDHR) as New Hampshire's State Historic Preservation Office (SHPO). The legislature of New Hampshire has determined that the historical, archeological, architectural, engineering, and cultural heritage of New Hampshire is among the most important environmental assets of the state and that the rapid social and economic development of contemporary society threatens the remaining vestiges of this heritage; therefore, it is public policy and in the public interest of the state to engage in a comprehensive program of historic preservation to promote the use and conservation of such property for the education, inspiration, pleasure, and enrichment of the citizens of New Hampshire. (RSA 227-C)

There are seven Native American archaeological sites present on the Station property and recorded with the State of New Hampshire: Healy's Island (27 RK 162), South Rock Storage Area (27 RK 170), Bolian # 2 (27 RK 452), Rock's Road (27 RK 75), Bolian #5 (27 RK 453), Hunt's Island (27 RK 164) and Seabrook Marsh (27 RK 165). In addition, several areas have been identified as having high site potential for the presence of Native American archaeological sites. As of the time of the writing of this plan, no development had been proposed within these areas. Thus, no impact to identified sites and areas of high site potential has occurred. Both the seven identified sites and the areas of high site potential should be avoided by any future construction. If future proposed construction cannot avoid these areas, then archaeological investigation should be undertaken in advance of the proposed construction.

1.3 Applicability

This plan is applicable to land-disturbing activities within the Owner Controlled Area, but outside the Protected Area. Areas identified as archeologically sensitive and areas known to contain archeological sites are documented in the Cultural Resources Management Plan. (See specifically Figures 4 and 5-F thru 5-N.)

1.4 References

- Cultural Resources Management Plan, Seabrook Nuclear Power Plant, Seabrook & Hampton Falls, New Hampshire; Brian Valimont, Ma; New England Archaeology Co., LLC; May 2010
- 2. 36 CFR 800; Advisory Council on Historic Preservation Protection of Historic Properties; Section 106 Process
- 3. New Hampshire Statutes; Chapter 227-C: Historic Preservation

1.5 Definitions

- 1. Culturally Protected Area Areas delineated as having a potential or containing known archeological sites.
- 2. Cultural Resources Resources that include but are not limited to:
 - a. Cemeteries, burial sites, funeral monuments, or other sites with human remains.
 - b. Historic buildings, structures, or building remains
 - c. Native American sites containing cultural artifacts (such as pottery, tools, weaponry, and other implements) and features (such as storage pits, hearth, fire pits, structural remains, etc.)
 - d. Ritual Artifacts
 - e. Discarded material (shells / animal bones)
- 3. Disturbed Land Areas Surface and Subsurface land areas that were significantly disturbed during construction phase of the site (i.e. Protected Area) or with ongoing activities.
- 4. Land-Disturbing Activities Within the context of the National Historic Preservation Act, these are activities that involve grading, construction of buildings, excavations, reforestation, landscaping, placement of any fill or spoil or other terrestrial impact.
- 5. Mitigation Plan A plan to avoid or minimize impact to an eligible historical property, or mitigate the adverse effect prepared in consultation with the NRC and State Historic Preservation Office.

1.6 **Responsibilities**

- 1.6.1 Licensing Manager
 - 1. Conduct environmental reviews of land disturbance activities in accordance with the NAEC to ensure either existing or potentially existing cultural resources are protected to the maximum extent practicable.
 - 2. Ensure the State Historic Preservation Office (SHPO) is notified of activities that may affect existing or potentially existing cultural resources.

1.6.2 <u>Seabrook Station Personnel</u>

Identify the need to perform an environmental and cultural resource review in accordance with the NAEC.

1.7 Requirements

- 1. Land-disturbing activities planned within areas containing or potentially containing archaeological, cultural or historic resources as identified in the Cultural Resources Management Plan, Seabrook Nuclear Power Plant, shall be surveyed by a state approved archaeologist prior to initiating ground-disturbing activities. NextEra Energy Seabrook shall forward completed surveys to the New Hampshire Division of Historic Resources.
- 2. If a survey identifies archaeological, cultural or historic resources or makes recommendations to protect archaeological, cultural or historic resources the New Hampshire Division of Historic Resources shall be consulted prior to undertaking the ground-disturbing activity.
- 3. If NextEra Energy Seabrook encounters unexpected archaeological, cultural or historic resources during any ground-disturbing activity the activity shall be stopped and the New Hampshire Division of Historic Resources shall be consulted prior to recommencing work. If these resources include human remains, the area shall be secured, Security and Control Room notified and the Seabrook Police called immediately to determine the need for criminal investigation.
- 4. The identification or discovery of any new archaeological, cultural or historic resources shall be conveyed to the New Hampshire Division of Historic Resources.

1.8 Instructional Steps

- 1. For land-disturbing activities occurring in the Protected Area or in non sensitive areas as identified in the Cultural Resources Management Plan, no reviews or surveys are required.
- 2. For land-disturbing activities in areas indentified as potentially containing archaeological, cultural or historic resources, contact the Licensing Manager to determine if an archaeological survey will need to be performed and to determine the need to submit project to the New Hampshire Division of Historic Resources for review.
- 3. Develop necessary mitigation and protection plans to protect potentially impacted or known cultural resources for review by the New Hampshire Division of Historic Resources.
- 4. At least once per year the Licensing Department shall perform a visual inspection of the accessible archaeological sites and visual inspection of potential and sensitive areas to verify no activities that could have affected archaeological, cultural or historic resources have occurred.

If NextEra Energy Seabrook encounters unexpected archaeological, cultural or historic resources during any ground-disturbing activity, the activity shall be stopped and the New Hampshire Division of Historic Resources shall be consulted prior to recommencing work. If these resources include human remains, the area shall be secured, Security and Control Room notified and the Seabrook Police called immediately to determine the need for a criminal investigation.

5.

NAEC Rev. 00

SEABROOK STATION
ADMINISTRATIVE PROCEDURE

Dig Safe		
SH 6.4		
Rev. 12		
· ·		
	·	` ت
Approved By: (Signature on file)	Date:	10/14/10
		Procedure Owner:
		Safety Manager

SH 6.4 Page 2 Rev. 12

Contents and Revision Status

Cover 1 Contents and Revision Status 2 1.0 OBJECTIVE 4 2.0 PROCEDURAL REFERENCES 4 3.0 SCOPE 4 4.0 INSTRUCTIONS 4 4.1 Definitions 4 4.2 Responsibilities 5 4.2.1 Nuclear Projects Manager 5 4.2.2 Work Group Supervisor 6 4.2.3 Competent Person 6 4.2.4 Employees and Contractors 7 4.2.5 Engineering Personnel 7 4.2.6 Radiation Protection Personnel 7 4.2.7 Contract Coordinators 7 4.2.8 Registered Professional Engineer 7 4.3 General – Process Requirements 8 4.3.1 General 8 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 8 4.3.4 During Excavation Activities 11 4.3.5 Job Completion 12 4.4 Specific Safety Requirements 12 4.4.1 <t< th=""><th><u>Conte</u></th><th>ents</th><th></th><th></th><th><u>Page No.</u></th></t<>	<u>Conte</u>	ents			<u>Page No.</u>	
Contents and Revision Status 2 1.0 OBJECTIVE 4 2.0 PROCEDURAL REFERENCES 4 3.0 SCOPE 4 4.0 INSTRUCTIONS 4 4.1 Definitions 4 4.2 Responsibilities 5 4.2.1 Nuclear Projects Manager 5 4.2.2 Work Group Supervisor 6 4.2.3 Competent Person 6 4.2.4 Employees and Contractors 7 4.2.5 Engineering Personnel 7 4.2.6 Readiation Protection Personnel 7 4.2.7 Contract Coordinators 7 4.2.8 Registered Professional Engineer 7 4.3 General Process Requirements 8 4.3.1 General 8 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 8 4.3.3 Pre-Job Requirements 10 4.3.4 During Excavation Activities 11 4.3.5 Job Completion 12 4.4 Specific Safety Requirements 12 4.4 Specific Safety Requirements 12 4.4.1 Inspection and Excavation Entry/Exit Criteria 12 4.4.2 Access and Egress 14 4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment 15	Cover				1	
1.0 OBJECTIVE 4 2.0 PROCEDURAL REFERENCES 4 3.0 SCOPE 4 4.0 INSTRUCTIONS 4 4.1 Definitions 4 4.2 Responsibilities 5 4.2.1 Nuclear Projects Manager 5 4.2.2 Work Group Supervisor 6 4.2.3 Competent Person 6 4.2.4 Employees and Contractors 7 4.2.5 Engineering Personnel 7 4.2.6 Radiation Protection Personnel 7 4.2.7 Contract Coordinators 7 4.2.8 Registered Professional Engineer 7 4.3 General – Process Requirements 8 4.3.1 General 8 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 8 4.3.3 Pre-Job Requirements 10 4.3.4 Specific Safety Requirements 12 4.4.1 Inspection and Excavation Entry/Exit Criteria 12 4.4.1 Access and Egress 14 4.3.3 Protection of Worke	Conter	nts and	Revisio	n Status	2	
 2.0 PROCEDURAL REFERENCES 3.0 SCOPE 4.1 Definitions 4.1 Definitions 4.2 Responsibilities 4.2 Responsibilities 4.2.1 Nuclear Projects Manager 4.2.2 Work Group Supervisor 4.2.3 Competent Person 4.2.4 Employees and Contractors 4.2.5 Engineering Personnel 4.2.6 Radiation Protection Personnel 4.2.7 Contract Coordinators 4.2.8 Registered Professional Engineer 4.3 General – Process Requirements 4.3.1 General 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 4.3.3 Pre-Job Requirements 4.3.4 During Excavation Activities 4.4 Specific Safety Requirements 4.4 Specific Safety Requirements 4.4.1 Inspection and Excavation Entry/Exit Criteria 4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment 15 	1.0	OBJECTIVE				
 3.0 SCOPE 4 4.0 INSTRUCTIONS 4.1 Definitions 4.1 Definitions 4.2 Responsibilities 4.2 Responsibilities 4.2.1 Nuclear Projects Manager 4.2.2 Work Group Supervisor 4.2.3 Competent Person 4.2.4 Employees and Contractors 4.2.5 Engineering Personnel 4.2.6 Radiation Protection Personnel 4.2.7 Contract Coordinators 4.2.8 Registered Professional Engineer 4.3 General – Process Requirements 4.3.1 General 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 4.3.3 Pre-Job Requirements 4.3.4 During Excavation Activities 4.3.5 Job Completion 4.4 Specific Safety Requirements 4.4.1 Inspection and Excavation Entry/Exit Criteria 4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment 	2.0	PROCEDURAL REFERENCES				
4.0 INSTRUCTIONS 4 4.1 Definitions 4 4.2 Responsibilities 5 4.2.1 Nuclear Projects Manager 5 4.2.2 Work Group Supervisor 6 4.2.3 Competent Person 6 4.2.4 Employees and Contractors 7 4.2.5 Engineering Personnel 7 4.2.6 Radiation Protection Personnel 7 4.2.7 Contract Coordinators 7 4.2.8 Registered Professional Engineer 7 4.3 General – Process Requirements 8 4.3.1 General 8 4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation 8 4.3.3 Pre-Job Requirements 10 4.3.4 During Excavation Activities 11 4.3.5 Job Completion 12 4.4 Specific Safety Requirements 12 4.4.1 Inspection and Excavation Entry/Exit Criteria 12 4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment 15	3.0	SCOP	E		4	
4.1Definitions44.2Responsibilities54.2.1Nuclear Projects Manager54.2.2Work Group Supervisor64.2.3Competent Person64.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15	4.0	INSTRUCTIONS			. 4	
4.2Responsibilities54.2.1Nuclear Projects Manager54.2.2Work Group Supervisor64.2.3Competent Person64.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15		4.1	Definitions		4	
4.2.1Nuclear Projects Manager54.2.2Work Group Supervisor64.2.3Competent Person64.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15		4.2	Respo	nsibilities	5	
4.2.2Work Group Supervisor64.2.3Competent Person64.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.1	Nuclear Projects Manager	5	
4.2.3Competent Person64.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.2	Work Group Supervisor	6	
4.2.4Employees and Contractors74.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.3	Competent Person	6	
4.2.5Engineering Personnel74.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.4	Employees and Contractors	7	
4.2.6Radiation Protection Personnel74.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.5	Engineering Personnel	7	
4.2.7Contract Coordinators74.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.6	Radiation Protection Personnel	7	
4.2.8Registered Professional Engineer74.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Inspection and Excavation Entry/Exit Criteria124.4.1Inspection and Excavation Entry/Exit Criteria124.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.7	Contract Coordinators	7	
4.3General – Process Requirements84.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Inspection and Excavation Entry/Exit Criteria124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.2.8	Registered Professional Engineer	7	
4.3.1General84.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15		4.3	Genera	eneral – Process Requirements		
4.3.2Dig Safe Permit (Form SH 6.4A) Initiation84.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.3.1	General	8	
4.3.3Pre-Job Requirements104.3.4During Excavation Activities114.3.5Job Completion124.4Specific Safety Requirements124.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.3.2	Dig Safe Permit (Form SH 6.4A) Initiation	8	
4.3.4 During Excavation Activities114.3.5 Job Completion124.4 Specific Safety Requirements124.4.1 Inspection and Excavation Entry/Exit Criteria124.4.2 Access and Egress144.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.3.3	Pre-Job Requirements	10	
4.3.5Job Completion124.4Specific Safety Requirements124.4Inspection and Excavation Entry/Exit Criteria124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.3.4	During Excavation Activities	11	
4.4Specific Safety Requirements124.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.3.5	Job Completion	12	
4.4.1Inspection and Excavation Entry/Exit Criteria124.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15		4.4	Specif	ic Safety Requirements	12	
4.4.2Access and Egress144.4.3Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment15			4.4.1	Inspection and Excavation Entry/Exit Criteria	12	
4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment 15			4.4.2	Access and Egress	14	
to Vehicular Traffic/Equipment 15			4.4.3	Protection of Workers and the Excavation from Exposure		
				to Vehicular Traffic/Equipment	15	
4.4.4 Exposure to Falling Loads 15			4.4.4	Exposure to Falling Loads	15	
4.4.5 Hazardous Atmospheres 15			4.4.5	Hazardous Atmospheres	15	
4.4.6 Water Accumulation 16			4.4.6	Water Accumulation	16	
4.4.7 Stability of Adjacent Structures 16			4.4.7	Stability of Adjacent Structures	16	
4.4.8 Protection of Workers from Loose Rock or Soil 16			4.4.8	Protection of Workers from Loose Rock or Soil	16	
4.4.9 Fall Protection 16			4.4.9	Fall Protection	16	

			SH Rev	6.4 Page 3 . 12
Cor	itents			Page No.
	4.5 Slop	ing/Shoring	•	17
5.0	FIGURES			
	Figure 5.1	Types of Soil		19
	Figure 5.2	Drawings Showing Underground Obstructions		21
	Figure 5.3	Limitations of Electronic Equipment		22
	Figure 5.4	Excavation Pre-Job Briefing Considerations		23
	Figure 5.5	Summary of Changes		26
6.0	FORMS			Rev. No.
	SH 6.4A	Dig Safe Permit		07
	SH 6.4B	Soil Analysis Checklist		05
				r.

1.0 **OBJECTIVE**

This procedure provides information and direction to prevent injury and equipment damage whenever the plane of the ground is broken.

2.0 PROCEDURAL REFERENCES

1. OSHA 29 CFR 1926 Subpart P, Excavations and Trenches

- 2. FP 2.6, Confined Space Entry
- 3. MS0517.19, Placement of Backfill
- 4. CR 04-07070, 04-08910, 04-11106, 05-15106, 07-05027
- 5. Environmental Compliance Manual (NAEC), Cultural Resource Protection Plan

3.0 SCOPE

Employees and contractors **shall** use this procedure, or have an alternate procedure approved per the NextEra Energy Policy on Constructing Facilities, when working within trenches and/or excavations, or performing other digging, drilling, or driving activities that are done utilizing mechanical or hydrological equipment that penetrates the plane of the ground. This procedure also applies to excavations by hand that are more than 12" below grade.

This procedure is not applicable if restoring ground level such as removing a pile of dirt from the ground surface, or removing debris from a culvert. It is also not applicable to the cutting of asphalt or routine grading of ground.

This procedure applies to all activities within the scope of the procedure within the owner-controlled area.

Land-disturbing activities planned within areas containing or potentially containing archaeological, cultural or historic resources as identified in the Cultural Resources Management Plan, Seabrook Nuclear Power Plant, shall be surveyed by a state-approved archaeologist prior to initiating ground disturbing activities. NextEra Energy Seabrook shall forward completed surveys to the New Hampshire Division of Historic Resources. Refer to the Environmental Compliance Manual (NAEC).

4.0 INSTRUCTIONS

4.1 Definitions

1. <u>Competent Person</u> - A person who has documented specific training in OSHA trenching applications and rules. A Competent Person is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous or dangerous to workers. The Competent Person is authorized to stop work and initiate prompt corrective measures to eliminate those conditions.

- 2. <u>Excavation</u> Any man-made cut, cavity, trench, or depression in an earth surface formed by earth removal. For the purposes of this procedure vacuuming, drilling, driving, digging, augering, and trenching are considered excavations.
- 3. <u>Protective system</u> A means of protecting workers from cave-ins, from material that could fall or roll from an excavation face or into an excavation, or from the collapse of adjacent structures. Protective systems include support systems, sloping and benching systems, shield systems, and other systems that provide necessary protection.
- 4. <u>Registered professional engineer</u> A person registered as a professional engineer in the state where work is performed.
- 5. <u>Shielding (shield system)</u> A structure able to withstand the forces imposed on it by a cave-in, thereby protecting workers within the structure. Shields can be permanent or portable structures that are moved along as work progresses. Shields used in trenches are usually referred to as trench boxes or trench shields.
- 6. <u>Shoring (shoring system)</u> A structure (e.g., metal hydraulic, mechanical, or timber) that supports the sides of an excavation and is designed to prevent cave-ins.
- 7. <u>Sloping (sloping system)</u> Excavations with sides inclined away from the excavation to prevent cave-ins. The angle of incline required to prevent cave-in varies with differences in such factors as the soil-type, environmental conditions of exposure, and application of surcharge loads.
- 8. <u>Trench</u> A narrow (in relation to its length) excavation made below the surface of the ground. In general the depth is greater than the width, but the width measured at the bottom does not exceed 15 feet. If forms or other structures are installed or constructed in an excavation so as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.
- 9. <u>Vacuum Excavation</u> The use of jets of air or water to loosen soil which is then picked up through a vacuum hose. Typically used for utility location.

4.2 **Responsibilities**

4.2.1 Nuclear Projects Manager

- 1. Is the process owner for any drilling, digging, excavation and trenching activities that fall within the scope of this procedure.
- 2. Is responsible for, or designates approval of Dig Safe Permit (form SH 6.4A).
- 3. Authorizes mechanical, hydrological, or vacuum excavation in the immediate vicinity of underground obstructions.
- 4. Determines the length of time Dig Safe Permit (form SH 6.4A) is maintained in his/her files for future reference in case of similar work or work in the same areas.

4.2.2 <u>Work Group Supervisor</u>

- 1. Ensures that the personnel performing work within the scope of this procedure understand and comply with the requirements of this procedure.
- 2. Ensures an underground Penetrating Radar Survey/Scan is completed prior to excavation being started as part of the Dig Safe Permit (form SH 6.4A) preparation.
- 3. Works with IRG and Maintenance Electrical to identify any potential underground obstructions from temporary power or communication lines.
- 4. Ensures the Dig Safe Permit (form SH 6.4A) has had an Engineering review that has identified the potential underground obstructions from the drawings.
- 5. Verifies that the Competent Person is qualified.
- 6. Ensures that the Dig Safe Permit (form SH 6.4A) is obtained, properly completed and appropriate signatures are obtained.
- 7. **Shall** promptly eliminate any identified or predictable hazardous condition in a trenching/excavation work environment.
- 8. If the work is outside the protected area, **shall** determine in conjunction with the Regulatory Compliance Supervisor if the area is an "Activities and Use Restriction Area". Worker and environmental protection requirements may be needed for subsurface activities in these areas. (Protected: Ref. 2.4)

4.2.3 Competent Person

- 1. Maintains full working knowledge of OSHA requirements and this procedure to ensure a safe work environment for employees that are working in or around an excavation.
- 2. Specifies appropriate measures on the Dig Safe Permits (form SH 6.4A) to ensure worker safety when requested by the Work Group Supervisor or work order planning personnel.
- 3. Classifies and documents soil type and determine protection requirements for excavations greater than 4 feet deep.
- 4. Performs inspections of excavations greater than 4 feet deep prior to personnel working in the excavation and on a daily basis in accordance with the requirements of §4.4.1.
- 5. Performs inspections of excavations greater than 4 feet deep after significant events such as rainstorms, freezing temperatures, etc.
- 6. Designs or approves the design of ramps used for personnel access and egress into excavations.

SH 6.4 Page 7 Rev. 12

- 7. Periodically monitors to ensure proper operation of water removal equipment and inspects the means used to divert runoff (see §4.4.6).
- 8. Promptly eliminates any identified or predictable hazardous condition in a trenching/excavation work environment.
- 9. Determines if trenches or excavations blasted into solid rock with stable walls may be vertical in rise without protection.

4.2.4 Employees and Contractors

Comply with this procedure when working within trenches and/or excavations, or performing other digging, drilling, or driving that is done by machine or by hand within the scope of this procedure.

4.2.5 Engineering Personnel

When providing input to the Dig Safe Permit (form SH 6.4A), review all drawings that exist for the site that could show any material/commodities buried in the ground for the area to be worked, including construction era drawings for temporary services. Review outstanding change documents that affected the drawings.

Any potential obstructions in the area of excavation **shall** be entered on the Dig Safe Permit (form SH 6.4A) with either a written explanation or by referencing and attaching a drawing or sketch that the implementer can easily interpret. These entries are to be made on the permit. Drawings and sketches become part of the permit when attached.

4.2.6 Radiation Protection Personnel

Approves the removal of asphalt or soil from the protected area.

4.2.7 Contract Coordinators

Ensure contractors, vendors, and/or visitors who perform excavation activities under the scope of this procedure or work within an excavation are aware of and comply with the requirements of this procedure.

4.2.8 <u>Registered Professional Engineer</u>

- 1. Approves the design of structural ramps used by equipment to access an excavation.
- 2. Evaluates the structural integrity of the structure where the stability of adjacent buildings, walls or other structures may be endangered by an excavation.
- 3. Determines the support system to ensure the stability of adjacent structures to ensure the stability of such structures for the protection of workers.
- 4. Prepares and/or approves shoring designs and any changes to the shoring design and approves the use of trench boxes.

SH 6.4 Page 8 Rev. 12

5. Designs sloping or benching for trenches or excavations greater than 20 feet deep in accordance with the requirements of §4.5.4.

4.3 General – Process Requirements

NOTE

Finding an unexpected underground obstruction or commodity while excavating (includes trenching, digging, drilling or driving, etc.) is an unwanted condition. This includes cathodic protection and ground cables. Work **shall** be put into a safe condition and will then be stopped until the situation can be assessed. An action request **shall** be initiated using NAMS.

If unexpected archaeological, cultural or historic resources are encountered during any ground-disturbing activity, the activity shall be stopped and the New Hampshire Division of Historic Resources shall be consulted prior to recommencing work. If these resources include human remains, the area shall be secured, Security and Control Room notified, and the Seabrook Police called immediately to determine the need for criminal investigation.

This section applies to all operations within the scope of this procedure.

4.3.1 General

- 1. Form SH 6.4A, Dig Safe Permit, **shall** be used any time an activity within the scope of this procedure is to be performed.
- 2. If the implementation of a design change will require an activity within the scope of this procedure, the need for the completion of form SH 6.4A, Dig Safe Permit, **shall** be identified in the "Implementation Considerations" section of the applicable design change document.
- 3. If the work is outside the protected area, Work Group Supervisor **shall** determine, in conjunction with the Regulatory Compliance Supervisor, if the area is an "Activities and Use Restriction Area." Worker and environmental protection requirements may be needed for subsurface activities in these areas. (Protected: Ref. 2.4)
- 4. The Work Group Supervisor **shall** ensure form SH 6.4A, Dig Safe Permit, is completed prior to beginning any activity within the scope of this procedure.

4.3.2 Dig Safe Permit (Form SH 6.4A) Initiation

1. Form SH 6.4A, Dig Safe Permit, is initiated by the Planner during the Work Order Planning.

- 2. The Work Group Supervisor shall ensure that the location of the proposed excavation, including the shape and depth of the excavation are properly identified on the Dig Safe Permit (form SH 6.4A).
- 3. The Work Group Supervisor **shall** ensure that IRG and Maintenance Electrical have identified any communication lines or temporary power lines in the vicinity of the planned excavation on the Dig Safe Permit (form SH 6.4A)
- 4. The Work Group Supervisor **shall** ensure Engineering is contacted to review and provide input to all excavation activities with regard to underground utilities/commodities such as water lines, electrical installations, system piping, or communication lines.
- 5. The Engineering personnel providing input to the Dig Safe Permit (form SH 6.4A) **shall** walk down the activity with the implementing organization prior to approval of the permit to ensure that the scope of the activity is understood and consistent with the engineering review. Also the walkdown will provide an opportunity to observe the physical environment to aid in the identification of potential obstacles.

NOTE

Both Mechanical and Electrical Design Engineering **shall** be contacted to determine if potential underground obstacles/commodities are present.

- 6. The Engineering personnel that provide input into the Dig Safe Permit (form SH 6.4A) **shall** ensure that the appropriate Engineering drawings have been reviewed prior to any excavation activities to prevent any damage to underground utilities such as water lines, electrical installations, or system piping. The specific drawings reviewed **shall** be identified in the Engineering Review section of form SH 6.4A. A partial listing of drawings is included in Figure 5.2.
- 7. The Engineering personnel that provide input to the Dig Safe Permit (form SH 6.4A) shall determine if an adjoining building, wall, or other structure could be endangered by the excavation operations. Section 4.4.7 requires this to be a Registered Professional Engineer.

SH 6.4 Page 10 Rev. 12

NOTE

Information from the engineering review regarding potential obstacles and notes **shall** be captured and entered on form SH 6.4A, Dig Safe Permit. If drawings or sketches are used to communicate potential hazards, they **shall** become part of the permit.

- 8. The Work Group Supervisor **shall** ensure that physical measures are taken to identify potential underground obstacles by the use of ground penetrating radar for the potential hazards (see Figure 5.3, Limitations of Electronic Equipment). Use of a qualified vendor to perform the dig safe scanning survey is the preferred method. The Work Group Supervisor **shall** ensure that the final Ground Penetrating Radar Survey results are obtained and attached to the Dig Safe Permit prior to initiation of work.
- 9. When underground obstructions are identified prior to excavating, either with the ground penetrating radar, or by a review of drawings, specific provisions will be made to minimize the potential for personnel injury and/or equipment damage. These provisions shall be documented on the Dig Safe Permit (form SH 6.4A). Hand digging is the preferred method to dig in the immediate vicinity of underground obstructions. Excavating mechanical or hydrological equipment in the immediate vicinity of underground obstructions can only be authorized by the Nuclear Projects Manager.
- 10. The Work Group Supervisor **shall** determine the need for de-energizing any of the potential obstacles underground with the appropriate organization, Operations for plant related equipment, Maintenance Electrical for campus power or IRG for communications equipment.
- 11. The Work Group Supervisor and the Nuclear Projects Manager, or Designee, shall sign the Dig Safe Permit (form SH 6.4A) before employees are allowed to start of excavation activities.
- 12. When a Dig Safe Permit (form SH 6.4A) is approved, a copy of the permit shall be maintained by the Nuclear Projects Department until the work scope has been completed.

4.3.3 Pre-Job Requirements

- 1. Before starting any excavation activity, the Work Group Supervisor **shall** ensure that the location that is going to be excavated has been inspected and marked for any potential underground obstacles.
- 2. Prior to beginning any work, the Work Group Supervisor **shall** ensure that the appropriate requirements of §4.4. and §4.5 are included in the Dig Safe Permit (form SH 6.4A) or the work order job plan.

SH 6.4 Page 11 Rev. 12

- 3. A pre-job brief **shall** be held using Figure 5.4, Excavation Pre-Job Briefing Considerations, and documented to familiarize all employees and groups with the work processes and potential hazards associated with the work prior to work.
- 4. Page 3 of the Dig Safe Permit (form SH 6.4A) is used to document initial entry inspections required by §4.4.1 of this procedure.

4.3.4 During Excavations Activities

- 1. Follow the specific requirements of §4.4 and 4.5. Page 3 of the Dig Safe Permit (form SH 6.4A) is used to document periodic inspections required by §4.4.1 of this procedure.
- 2. While the job is in progress, a copy of the permit **shall** be either posted or included in the work order. If the permit is posted at the work site it **shall** be removed when all work is completed and no further entry is required.

CAUTION

Underground piping that has a protective coating could contain asbestos. The requirements of SH 6.1, Asbestos Handling and Training Requirements, shall be met before proceeding if underground piping with a protective coating is uncovered and will be disturbed.

NOTE

Notify Plant Engineering to perform a visual inspection when underground piping is exposed.

If unexpected archaeological, cultural or historic resources are encountered during any ground-disturbing activity, the activity shall be stopped and the New Hampshire Division of Historic Resources shall be consulted prior to recommencing work. If these resources include human remains, the area shall be secured, Security and Control Room notified, and the Seabrook Police called immediately to determine the need for criminal investigation.

3. If an underground commodity is struck with a power tool, whether it is known or unknown, the job **shall** be stopped immediately and equipment placed in a safe condition and an action request **shall** be generated using NAMS. Work may not be restarted without approval of the Nuclear Projects Manager.

SH 6.4 Page 12 Rev. 12

- 4. Scope changes to Work Orders and/or Design Change Notices must be reviewed by the Work Group Supervisor for potential revisions to the existing Dig Safe Permit. Changes to work activities that affect the scope of the reviews performed as part of the original permit approval process require that the permit be reviewed and reapproved. Changes to the excavation method require the permit to be re-approved.
- 5. Any material from an excavation that will be removed from the protected area **shall** be released by the Radiation Protection Department before it exits the protected area.

4.3.5 Job Completion

- 1. Upon the completion of the installation of field run commodities underneath the surface of the ground, as-built drawings **shall** be submitted to the appropriate design engineering supervisor on an action request for incorporation into the appropriate drawings.
- 2. When the job is completed, the Work Group Supervisor **shall** include the original copy of the Dig Safe Permit (form SH 6.4A) with the work package. The Nuclear Projects Manager may retain a copy of the permit for future reference and/or program assessment.
- 3. After work is complete and the trench/excavation has been cleared, the excavation should be backfilled as soon as possible, per MS0517.19, Placement of Backfill.

4.4 Specific Safety Requirements

4.4.1 Inspections and Excavation Entry/Exit Criteria

- 1. Before entering and performing any work within a trench or excavation greater then 4 feet deep, entrants shall ensure a Competent Person has inspected the trench/excavation to ensure no potential of injury from a cave-in or other hazards exists. This inspection shall include the appropriate elements from the specific safety requirements of §s 4.4 and 4.5 of this procedure.
 - Both the work supervisor and the Competent Person **shall** sign page 3 of the Dig Safe Permit (form SH 6.4A) before employees are allowed into any trench/excavation.
 - When work is in progress, a Competent Person **shall** inspect the trench/excavation daily and sign-off on page 3 of the Dig Safe Permit (form SH 6.4A).

SH 6.4 Page 13 Rev. 12

NOTE

Inspections are required only when employee exposure can be reasonably anticipated. If entry **will not** be made, a Competent Person is **not** required to sign off the Dig Safe Permit (form SH 6.4A) on that day.

- 2. The daily inspections of the excavations, adjacent areas, and protective systems required by §4.4.1.1 **shall** include the following:
 - a. verification that sampling for hazardous atmospheres has been performed when required (reference §4.4.5)
 - b. unsafe conditions
 - c. evidence of potential cave-ins
 - d. indications of failure of protective systems
 - e. unsanitary conditions (sewage, waste water, insects or rodents)
- 3. When entry is required into a trench or excavation greater than 4 feet deep, a Competent Person shall classify and document soil type(s) and determine protection requirements. Soil classification(s) shall be made
 - a. upon starting work.
 - b. per 100 feet of trenching/excavation work.
 - c. for each layer of soil identified in the excavation.
 - d. when soil conditions change.

Soil classification by the Competent Person **shall** include at least one visual and one manual test method. Soil classification is performed using Figure 5.1 and the Soil Analysis Checklist, (form SH 6.4B). If no soil testing is performed, the trench/excavation must be classified as Type C soil.

- 4. If the Competent Person expresses concern and does **not** allow initial entry, the supervisor **shall** take corrective measures and request a re-inspection.
- 5. A Competent Person **shall** re-inspect and sign-off on the Dig Safe Permit (form SH 6.4A) before entry into excavations greater than 4 feet deep after significant events such as rainstorms, freezing temperatures, etc.

SH 6.4 Page 14 Rev. 12

- 6. Employees **shall** exit any trench/excavation when told to do so by a Competent Person, or when warning signs of failure are identified. Warning signs of failure include, but are not limited to the following:
 - tension cracks within the soil
 - ground settlement
 - changes in wall slope
 - spalling or sloughing of the walls or bank
 - water seepage into the trench or excavation
 - boiling/bubbling of trench bottom
 - unusual deformation of bracing struts
 - bowing of structural members
 - cracking or popping sounds
- 7. Employees **shall not** enter or re-enter any trench/excavation determined or suspected to be unsafe. Employees **shall** notify the Work Group Supervisor of any concerns and resolve all concerns with a Competent Person.
- 8. Excavations 5 feet or greater in depth **shall** have an adequate protection system. (Reference §4.5)
- 4.4.2 Access and Egress
 - 1. Equipment for Egress

In case of emergency, employees must be able to leave the trench/excavation quickly. For excavations deeper than 4 feet, employees **shall** have ladders or ramps in position for access and egress.

- a. Ladders or ramps **shall** be spaced at intervals of no more than 25 feet or lateral travel distance from any point in the trench/excavation.
- b. Ladders must be in good condition, extend from the floor of the trench to 3 feet (minimum) above the top of the excavation, and be secured at the top (when possible).

- 2. Structural Ramps
 - a. Structural ramps that are used solely by workers as a means of egress from excavations shall be designed by a Competent Person.
 - b. A registered professional engineer **shall** design structural ramps used by equipment.

4.4.3 Protection of Workers and the Excavation from Exposure to Vehicular Traffic/Equipment

- 1. Employees exposed to vehicular traffic **shall** wear vests made of reflective or high-visibility material. Trenching and excavation sites located in an area of vehicular traffic **shall** be protected with orange traffic cones, signs, and flaggers, as required.
- 2. Trenches or excavations that are left open or unattended **shall** have physical barriers in place, such as barricades, guardrails, or covers.
- 3. Occupied or attended excavations with a depth of 6 feet or more, that cannot be readily seen due to plant growth or other visual barrier(s), **shall** be protected by using guardrails, barricades, or covers to prevent employees from unknowingly approaching, or working near the edge, and falling into the excavation.
- 4. When mobile equipment is operated adjacent to an excavation, or when such equipment is required to approach the edge of an excavation, and the operator does not have a clear and direct view of the edge of the excavation, a warning system **shall** be utilized such as barricades, hand or mechanical signals, or stop logs. If possible the grade should be away from the excavation.

4.4.4 Exposure to Falling Loads

When involved in trenching/excavation activities, employees **shall** stand clear of backhoes, front-end loaders, etc. Employees **shall not** work beneath suspended loads handled by lifting or digging equipment.

4.4.5 <u>Hazardous Atmospheres</u>

Where the potential for hazardous atmosphere/oxygen deficiency exists, employees **shall** follow the requirement of procedure FP 2.6, Confined Space Entry, and ensure appropriate tests are conducted before entering the trench/excavation.

- 1. Contact Fire Protection and have the trench/excavation evaluated to determine if it meets the definition and criteria of a confined space.
- 2. If the trench/excavation is classified as a confined space, entrants must have completed confined space training.

4.4.6 <u>Water Accumulation</u>

- 1. Workers **shall** not work in an excavation in which there is accumulated water, or in which water is accumulating, unless adequate precautions have been taken to protect workers from the hazards posed by water accumulation.
- 2. If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operations **shall** be periodically monitored by a Competent Person to ensure proper operation.
- 3. If the excavation work interrupts the natural drainage of surface water, diversion ditches, dikes or other suitable means **shall** be used to prevent surface water from entering the excavation and to provide adequate drainage of the area adjacent to the excavation. The Competent Person **shall** inspect the means used to divert the runoff.

4.4.7 <u>Stability of Adjacent Structures</u>

Where the stability of adjacent buildings, walls or other structures is endangered by excavation operations, a Registered Professional Engineer **shall** evaluate the structural integrity of the structure for the excavation. The Registered Professional engineer **shall** determine the support systems such as shoring, bracing, or underpinning to ensure the stability of such structures for the protection of the workers.

4.4.8 Protection of Workers from Loose Rock or Soil

- 1. To keep the spoil (excavated dirt) or material from falling back into the trench/excavation, workers should ensure excavated or other material is effectively stored and retained at least 2 feet from the edge of the excavation. The excavated material must be covered by suitable means to prevent run-off of the material into storm drains, catch basins, etc.
- 2. Where it is not possible to keep material two feet from the edge of the excavation, retaining devices/protective barricades that are sufficient to prevent materials or equipment from falling or rolling into the excavation **shall** be used.

4.4.9 <u>Fall Protection</u>

Walkways **shall** be provided where workers or equipment are required or permitted to cross over excavations. Guardrails **shall** be provided where walkways are 6 feet or more above lower levels.

4.5 Sloping/Shoring

All trenches/excavations with wall height between 5 and 20 feet are sloped, shored, sheeted, braced, or otherwise supported. When soil conditions are unstable, excavations lower than 5 feet must also be sloped, supported, or shored.

NOTE

Competent Persons must consider and determine the degree to which actual slopes are reduced because of surcharge loading, operating equipment or traffic.

1. Walls of unsupported trenches/excavations must be sloped according to the soil classification (i.e., Type A, B, or C). Soil type is determined using Figure 5.1, Types of Soil, and the Soil Analysis Checklist, form SH 6.4B.

Soil or Rock Type	Max. Allowable Slope	Angle
Stable Rock (most stable)	Vertical	90 degrees
Type A Soil (very stable)	0.75:1 slope	53 degrees
Type B Soil (average soil)	1:1-slope	45 degrees
Type C Soil (least stable)	1.5:1 slope	34 degrees

- 2. Trenches or excavations blasted into solid rock with stable walls may be vertical in rise without protection, as determined by inspection of a Competent Person.
- 3. A registered professional engineer must approve the use of trench boxes. When sloping methods are used in conjunction with a trench box, begin sloping 18 inches below the top of the box and continue sloping to the original ground elevation.
- 4. A registered professional engineering **shall** design sloping or benching for trenches or excavations greater than 20 feet deep.
 - a. All designs by a registered professional engineer shall be in written format and convey configurations deemed safe for each particular project.
 - b. All designs **shall** identify the registered professional engineer approving the design.
 - c. At least one copy of the design **shall** be kept at the job site while work is performed.

d. After job completion, a copy of the design **shall** be retained in the work order and may be retained by the Nuclear Projects Department for future reference and the OSHA record keeping requirements of 29 CFR 1926.

SH 6.4 Page 18 Rev. 12

- 5. Removal shall be performed as follows:
 - a. If shoring must be removed, workers should remove the shoring from the bottom up, taking care to release jacks or braces slowly.
 - b. In unstable soil, ropes should be used to pull out the jacks or braces from above.

SH 6.4 Page 19 Rev. 12

Figure 5.1 Types of Soil

(Sheet 1 of 2)

TYPE A

NOTE

For Type A soil excavations less than 20 feet deep, the maximum allowable slope is 0.75:1 (H:V).

• Cohesive soils such as the following with an unconfined compressive strength of 1.5 tons per square foot (TFS) (144 kPa) or greater:

- Clay
- Silty clay
- Sandy clay
- Clay loam
- Silty clay loam and sandy clay loam in some cases
- Cemented soils (e.g., caliche, hardpan).

Soils Not Considered Type A

- Fissured soil
- Soil subject to vibration from heavy traffic, pile driving, or similar effects.
- Previously disturbed soil (which includes the majority of the soil around the site).
- Soil that is part of a sloped, layered, system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or greater.
- Soil subject to other factors that would require it to be classified as a less stable material.

TYPE B

NOTE

For Type B soil excavations less than 20 feet deep, the maximum allowable slope is 1:1 (H:V).

• Cohesive soils with an unconfined compressive strength greater than 0.5 TSF (48 kPa), but less than 1.5 TSF (144 kPa).

SH 6.4 Page 20 Rev. 12

Figure 5.1 Types of Soil (Sheet 2 of 2)

TYPE B (Continued)

- Granular cohesionless solids including
 - Angular gravel (similar to crushed rock)
 - ♦ Silt
 - Silt loam
 - Sandy loam
 - Silty clay loam and sandy clay loam in some cases
- Previously disturbed soils except those that would otherwise be classed as Type C soil.
- Soils that meet the unconfined compressive strength or cementation requirements for Type A, but not fissured or subject to vibration.
- Dry rock that is not stable.
- Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than 4 horizontal to 1 vertical (4H:1V), but only if the material would otherwise be classified as Type B.

TYPE C

NOTE

For Type C soil excavations less than 20 feet deep, the maximum allowable slope is 1.5:1 (H:V).

- Cohesive soils with an unconfined compressive strength of 0.5 TSF (49 kPa) or less.
- Granular soils, including gravel, sand, and loamy sand.
- Submerged soil or soil from which water is freely seeping.
- Submerged rock that is not stable.
- Material in a sloped, layered system where the layers dip into the excavation on a slope of 4 horizontal to 1 vertical (4H:1V) or steeper.

SH 6.4 Page 21 Rev. 12

Figure 5.2 Drawings Showing Underground Obstructions

The following is a partial listing of drawings showing potential underground obstructions.

9763-FSU-282 9763-F-300245 1-NHY-301605 1-NHY-301606 1-NHY-301607 1-NHY-301608 1-NHY-301609 1-NHY-301802 9763-F-301623 9763-F-301624 9763-F-301625 9763-F-310248 9763-F-310249 9763-F-310223 9763-F-320223 9763-F-320251 9763-F-320252 9763-F-604051 9763-F-604052 9763-F-604076 9763-F-604149 9763-F-604150 9763-F-604151 9763-F-604152 9763-F-604153 9763-F-604154 9763-F-604155 9763-F-604156 9763-F-604157

98DCR015 Cathodic Protection Underground System Enhancements.

SH 6.4 Page 22 Rev. 12

Figure 5.3 Limitations of Electronic Equipment

The following limitations of electronic survey equipment should be considered during performance of all dig safe ground surveys:

Ground Penetrating Radar (GPR)

- Signal penetration is site specific and is determined by dielectric properties of the soil or fill materials.
- Objects deeper than the signal's maximum penetration depth remains undetected.
- Interpretations are subjective and are based on identifying reflection patterns that may not uniquely represent a subsurface object.
- Varying an antenna's speed along a survey traverse can cause slight errors in horizontal distance interpolations and inferred object positions.
- GPR is most likely to detect concrete or metallic objects with the exception of metallic objects located under reinforced concrete because the signal couples onto the metal rebar and mesh in the concrete, and the signal on a particular metallic object cannot then be traced with any reliability. Plastic or vitreous clay pipes, or Fiberglas objects are unlikely to be detected.
- Small diameter objects may be difficult to detect unless they are quite shallow (less than 1.5 feet).
- Closely spaced pipe may produce reflections that resemble a single object.
- If two pipes occupy the same trench at different depths, only the shallower pipe may be detected.

Metal Detector

- A change in ground mineral conditions can give a visual indication.
- It is possible to get a null reading if directly over a source.

Figure 5.4 Excavation Pre-Job Briefing Considerations

(Sheet 1 of 3)

OBJECTIVE:

The objective of this document is to provide specific expectations, considerations, and Operating Experience to support the conduct of Pre-Job Briefings associated with Dig Safe related activities. This document should be used with WM 8.0A, Job Briefing Guideline.

REFERENCES:

- NPDI-001, Nuclear Projects Expectations and Conduct of Business
- SH 6.4, Dig Safe
- Work Management Manual (NAWM)
- OSHA 29 CFR Part 1926 Subpart P (Excavations and Trenches)
- MS0517.19, Placement of Backfill
- CR# 02-01822, 02-11928, 03-05931, 03-10422, 04-03556, 04-06261, 04-07070, 04-08428, 04-08429, 04-08910, 04-08979, 04-09283, 04-09336, 04-09757, 04-09858, 04-10626, 04-10850, 04-11106, 04-12266, 05-04908, 05-06168, 05-08750, 05-10360, 05-15106
- INPO Industry OE (eg. OE#'s 16790, 17394, 17418, 17752, 17939, 18832, 18839, 18840, 18910, 19145, 19108, 21580, etc.)
- SBK CS602I, CS6003I

Summary:

Protecting employees from job-related hazards is a <u>top priority</u> at Seabrook Station. The job briefing is a forum that provides an opportunity for workers and supervisors to identify, discuss, and mitigate potential job hazards, discover human error traps and promotes the exchange of ideas and experience.

CR# 05-15106 was the most recently generated condition report pertaining to an excavation related event at Seabrook Station. As indicated above in the "Reference" section, there have been numerous documented occurrences associated with excavation related activities since 2002.

Why is this significant?

Subsurface excavation activities creates significant potential hazards to personnel and the operating equipment/components that support the safe effective operation of Seabrook Station. Due to site-specific, as well as industry events that resulted from excavation and/or trenching activities, administrative and technical controls have been established to ensure that underground obstructions or commodities are not unexpectedly encountered. The specific requirements for working within trenches and/or excavations, or performing other digging, drilling, or pile driving activities that are done by machine that penetrates the plane of the ground surface, as well as excavations performed by hand that exceed a depth of 12" below grade, are contained in this procedure (NASH, procedure SH 6.4).

SH 6.4 Page 24 Rev. 12

Figure 5.4

Excavation Pre-Job Briefing Considerations

(Sheet 2 of 3)

What do I need to consider?

- SH 6.4 is the governing document and **shall** be used for all excavation-related activities at Seabrook Station.
- The Nuclear Projects Manager, or designee, is responsible for approving Dig Safe Permits (form SH 6.4A).
- The Work Group Supervisor is responsible for ensuring that personnel performing work within the scope of SH 6.4 are qualified prior to initiating work activities, and understand and comply with the requirements set forth in SH 6.4.
- A subsurface scan shall be completed by an approved geotechnical surveying service, and the result will be reviewed prior to Dig Safe Permit approval.
- Consider vacuum excavation to locate services before major work.
- If required, a qualified "competent person" shall be designated to support the excavation/trenching activity, in accordance with SH 6.4, §4.2.3.
- A copy of the Dig Safe permit shall be posted at the work site at all times until the excavation activities are completed.
- A Work Order will be the implementing document for any excavation activities at Seabrook Station.
- Any change in condition or work scope will not be implemented prior to the Dig Safe permit being revised to reflect the change, as well as a scope change being generated for the implementing Work Order.
- All subsurface components are to be considered permanent and energized regardless of belief, and are not to be physically altered, modified, or removed without approved documentation.
- A dedicated safety spotter will be assigned for excavation/digging activities that requires mechanical equipment, when being operated directly adjacent to, or having the potential to come into contact with, operating structures, systems, or components (SSC).
- Upon discovery of an unexpected or unwanted condition, workers are to immediately STOP and notify supervisory personnel so the condition can be assessed. If unexpected archaeological, cultural or historic resources are encountered during any ground-disturbing activity, the activity shall be stopped and the New Hampshire Division of Historic Resources shall be consulted prior to recommencing work. If these resources include human remains, the area shall be secured, Security and Control Room notified, and the Seabrook Police called immediately to determine the need for criminal investigation.
- Whether expected or unexpected, when an underground commodity is struck, the work **shall** be immediately stopped and the equipment placed in a safe condition. Work may not be restarted without approval of the Nuclear Projects Manager.
- Following any occurrence of an excavation-related (Dig Safe) event, work can recommence only following approval by the Nuclear Projects Manager.

What else should I consider every day before I begin work?

• All personnel will STOP when unsure and obtain supervisory guidance for resolution.

Figure 5.4

Excavation Pre-Job Briefing Considerations

(Sheet 3 of 3)

- The use of Human Performance Tools (STAR, Self-Checking, Peer Checking, 3-Way Communication, QV&V, STOP When Unsure) and the 5 Activity Preview Questions shall be covered every day during each Pre Job Briefing prior to initiating work activities.
- Work documentation will be prepared and approved prior to implementation of any work activity.
- Work Order documentation is to be maintained current on a daily basis.
- All permits are to be reviewed daily to ensure they are appropriate for the existing conditions.
- PPE will be donned at all times in accordance with the posted or communicated requirements.
- Action requests will be generated for any unwanted/unexpected situation or result.

SH 6.4 Page 26 Rev. 12

Figure 5.5 Summary of Changes

Rev 12:

Added reference and Note to Cultural Resource Protection Plan as it pertains to encountering unexpected archaeological, cultural or historic resources during any ground-disturbing activity and the actions required.

Rev. 11:

After §4.3.4, step 2, added a Caution concerning underground piping that has a protective coating that could contain asbestos.

Updated company name.

Changed references to condition report to action request to reflect NAMS terminology.

Removed references to canceled procedures (OE 3.1 and 3.6).

Rev. 10:

Included a Drawing 9763-F-301625 to Figure 5.2 due to 06MMOD507, DFS Security and Electrical Enclosure.

Rev. 09:

Included a definition and description of vacuum trenching.

Rev. 08:

This revision was initiated in response to CR 07-05027. Specific changes are as follows:

- In §4.3.2, step 8, added, "Use of a qualified vendor to perform the dig safe scanning survey is the preferred method."
- Added Note after §4.3.4, step 2, as follows: Notify Plant Engineering to perform a visual inspection when underground piping is exposed.