		General Emergency	Site Area Emergency	Alert	Unusual Event
R Abnorm. Rad Release / Rad Effluent	1 Offsite Rad Conditions	RG1.1 1 2 3 4 5 D **ANY** monitor reading > Table R-1 "GE" column for ≥ 15 min. (Note 1) • Do **not** delay declaration awaiting dose assessment results • If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values (see EAL RG1.2)	RS1.1 1 2 3 4 5 D **ANY** monitor reading > Table R-1 "SAE" column for ≥ 15 min. (Note 1) • Do **not** delay declaration awaiting dose assessment results • If dose assessment results are available, declaration should be based on dose assessment instead of radiation monitor values (see EAL RS1.2)	RA1.1 1 2 3 4 5 D **ANY** gaseous monitor reading > Table R-1 "Alert" column for ≥ 15 min. (Note 2)	RU1.1 1 2 3 4 5 D **ANY** gaseous monitors > Table R-1 "UE" column for ≥ 60 min. (Note 2)
				RA1.2 1 2 3 4 5 D **ANY** liquid monitor > Table R-1 "Alert" column for ≥ 15 min. (Note 2)	RU1.2 1 2 3 4 5 D **ANY** liquid monitor reading > Table R-1 "UE" column for ≥ 60 min. (Note 2)
		RG1.2 1 2 3 4 5 D Dose assessment using actual meteorology indicates doses > 1,000 mRem TEDE or 5,000 mRem thyroid CDE at or beyond the SITE BOUNDARY	RS1.2 1 2 3 4 5 D Dose assessment using actual meteorology indicates doses > 100 mRem TEDE or 500 mRem thyroid CDE at or beyond the SITE BOUNDARY	None	None
		RG1.3 1 2 3 4 5 D Field survey results indicate closed window dose rates > 1,000 mRem/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Note 1) **OR** Analyses of field survey samples indicate thyroid CDE > 5,000 mRem for 1 hr of inhalation at or beyond the SITE BOUNDARY (Note 1)	RS1.3 1 2 3 4 5 D Field survey results indicate closed window dose rates > 100 mRem/hr expected to continue for ≥ 60 min. at or beyond the SITE BOUNDARY (Note 1) **OR** Analyses of field survey samples indicate thyroid CDE > 500 mRem for 1 hr of inhalation at or beyond the SITE BOUNDARY (Note 1)	RA1.3 1 2 3 4 5 D Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 200 x ODCM limits for ≥ 15 min. (Note 2)	RU1.3 1 2 3 4 5 D Confirmed sample analyses for gaseous or liquid releases indicate concentrations or release rates > 2 x ODCM limits for ≥ 60 min. (Note 2)
				None	None
	2 Onsite Rad Conditions & Spent Fuel Events	**Table R-1 Effluent Monitor Classification Thresholds** GASEOUS: Radwaste/RB Vent Effluent — GE: 5.5E+7 µCi/s; SAE: 5.5E+6 µCi/s; ALERT: 200 x Alarm; UE: 2 x Alarm GASEOUS: Main Stack Effluent — GE: 1.0E+10 µCi/s; SAE: 1.0E+9 µCi/s; ALERT: 200 x Alarm; UE: 2 x Alarm LIQUID: Service Water Effluent — GE: N/A; SAE: N/A; ALERT: 200 x DRMS High (red); UE: 2 x DRMS High (red) LIQUID: Liquid RadWaste Effluent — GE: N/A; SAE: N/A; ALERT: N/A; UE: 2 x DRMS High (red) LIQUID: Cooling Tower Blowdown — GE: N/A; SAE: N/A; ALERT: 200 x DRMS High (red); UE: 2 x DRMS High (red)		RA2.1 1 2 3 4 5 D Alarm on **ANY** of the following radiation monitors due to damage to irradiated fuel or loss of water level: • 2RMS-RE111 • 2RMS-RE112 • 2RMS-RE113 • 2RMS-RE114 • 2RMS-RE140 • 2HVR*RE14A • 2HVR*RE14B	RU2.1 1 2 3 4 5 D UNPLANNED water level drop in a reactor refueling pathway as indicated by inability to restore and maintain SFP level > low water level alarm (Note 3) **AND** Area radiation monitor reading rise on **ANY** of the following: • 2RMS-RE111 • 2RMS-RE112 • 2RMS-RE113 • 2RMS-RE114 • 2RMS-RE140
				RA2.2 1 2 3 4 5 D A water level drop in a reactor refueling pathway that will result in irradiated fuel becoming uncovered	RU2.2 1 2 3 4 5 D UNPLANNED area radiation readings rise by a factor of 1,000 over NORMAL LEVELS
	3 CR/CAS Rad	None	None	RA3.1 1 2 3 4 5 D Dose rates > 15 mRem/hr in **EITHER** of the following areas requiring continuous occupancy to maintain plant safety functions: Control Room **OR** CAS	None
H Hazards & Other Conditions Affecting Plant Safety	1 Natural or Destructive Phenomena	**Table H-1 Safe Shutdown Areas** • Reactor Building (including Primary Containment) • Control Room • Diesel Generator Engine and Board Rooms • Standby Switchgear and Battery Rooms • HPCS Switchgear and Battery Rooms • Remote Shutdown Rooms • Control Building HVAC Rooms • Service Water Pump Rooms • Electrical Protection Assembly Room • PGCC Relay Room **Notes** 1. The ED should **not** wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition will likely exceed the applicable time 2. The ED should **not** wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the release duration has exceeded, or will likely exceed, the applicable time. In the absence of data to the contrary, assume that the release duration has exceeded the applicable time if an ongoing release is detected and the release start time is unknown. 3. If loss of water level in the refueling pathway occurs while in Mode 4, 5 or D, consider classification under EALs CU3.1, CU3.2 or CU3.3 4. The ED should **not** wait until the applicable time has elapsed, but should declare the event as soon as it is determined that the condition has exceeded, or will likely exceed, the applicable time. 5. If the equipment in the stated area was already inoperable, or out of service, before the event occurred, then EAL HA3.1 should **not** be declared as it will have **no** adverse impact on the ability of the plant to safely operate or safely shutdown beyond that already allowed by Technical Specifications at the time of the event.		HA1.1 1 2 3 4 5 D Seismic event > OBE (0.075g) as indicated by **EITHER**: Computer Point ERSNC02, OBE Detected **OR** ANY amber LED light lit at the Seismic Monitor Panel, Response Spectrum Annunciator **AND** Earthquake confirmed by **ANY** of the following: • Earthquake felt in plant • JAFNPP seismic instrumentation • Control Room indication of degraded performance of systems required for the safe shutdown of the plant	HU1.1 1 2 3 4 5 D Seismic event identified by **ANY two** of the following: • Annunciator 842121 SEISMIC ACCELERATION EXCEEDED indicates seismic event detected • Confirmation of earthquake received on NMP-1 or JAFNPP seismic instrumentation • Earthquake felt in plant
				HA1.2 1 2 3 4 5 D Tornado striking **OR** Sustained high winds > 90 mph resulting in **EITHER**: VISIBLE DAMAGE to **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area **OR** Control Room indication of degraded performance of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area	HU1.2 1 2 3 4 5 D Tornado striking within PROTECTED AREA boundary **OR** Sustained high winds > 90 mph
				HA1.3 1 2 3 4 5 D Internal flooding resulting in **EITHER**: An electrical shock hazard that precludes access to operate or monitor **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area **OR** Control Room indication of degraded performance of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area	HU1.3 1 2 3 4 5 D Internal flooding that has the potential to affect **ANY** SAFETY-RELATED STRUCTURE, SYSTEM, OR COMPONENT required by Technical Specifications for the current operating mode in **ANY** Table H-1 area
				HA1.4 1 2 3 4 5 D Turbine failure-generated PROJECTILEs resulting in **EITHER**: VISIBLE DAMAGE to or penetration of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area **OR** Control Room indication of degraded performance of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area	HU1.4 1 2 3 4 5 D Turbine failure resulting in **ANY** of the following: • Casing penetration • Damage to turbine seals • Damage to generator seals
				HA1.5 1 2 3 4 5 D Lake water level > 254 ft **OR** Intake water level < 233 ft	HU1.5 1 2 3 4 5 D Lake water level > 248.2 ft **OR** Intake water level < 237 ft
				HA1.6 1 2 3 4 5 D Vehicle crash resulting in **EITHER**: VISIBLE DAMAGE to **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area **OR** Control Room indication of degraded performance of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area	
	2 Fire or Explosion	None	None	HA2.1 1 2 3 4 5 D FIRE or EXPLOSION resulting in **EITHER**: VISIBLE DAMAGE to **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area **OR** Control Room indication of degraded performance of **ANY** SAFETY-RELATED STRUCTURE, SYSTEM or COMPONENT within **ANY** Table H-1 area	HU2.1 1 2 3 4 5 D FIRE **not** extinguished within 15 min. of Control Room notification or verification of a Control Room FIRE alarm in **ANY** Table H-1 area or Turbine Building (Note 4) HU2.2 1 2 3 4 5 D EXPLOSION of sufficient force to damage permanent structures or equipment within the PROTECTED AREA
	3 Hazardous Gas	None	None	HA3.1 1 2 3 4 5 D Access to **ANY** Table H-1 area is prohibited due to toxic, corrosive, asphyxiant or flammable gases which jeopardize operation of systems required to maintain safe operations or safely shutdown the reactor (Note 5)	HU3.1 1 2 3 4 5 D Toxic, corrosive, asphyxiant or flammable gases in amounts that have or could adversely affect NORMAL PLANT OPERATIONS HU3.2 1 2 3 4 5 D Recommendation by local, county or state officials to evacuate or shelter site personnel based on an offsite event
	4 Security	HG4.1 1 2 3 4 5 D A HOSTILE ACTION has occurred such that plant personnel are unable to operate equipment required to maintain safety functions HG4.2 1 2 3 4 5 D A HOSTILE ACTION has caused failure of Spent Fuel Cooling systems **AND** IMMINENT fuel damage is likely	HS4.1 1 2 3 4 5 D A HOSTILE ACTION is occurring or has occurred within the PROTECTED AREA as reported by the Security Site Supervisor	HA4.1 1 2 3 4 5 D A HOSTILE ACTION is occurring or has occurred within the Owner Controlled Area as reported by the Security Site Supervisor **OR** A validated notification from NRC of an AIRLINER attack threat within 30 min. of the site	HU4.1 1 2 3 4 5 D A SECURITY CONDITION that does **not** involve a HOSTILE ACTION as reported by the Security Site Supervisor **OR** A credible site-specific security threat notification **OR** A validated notification from NRC providing information of an aircraft threat
	5 Control Room Evacuation	None	HS5.1 1 2 3 4 5 D Control Room evacuation has been initiated **AND** Control of the plant **cannot** be established within 15 min.	HA5.1 1 2 3 4 5 D Control Room evacuation has been initiated	None
	6 Judgment	HG6.1 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or IMMINENT substantial core degradation or melting with potential for loss of containment integrity or HOSTILE ACTION that results in an actual loss of physical control of the facility. Releases can be reasonably expected to exceed EPA Protective Action Guideline exposure levels (1,000 mRem TEDE or 5,000 mRem thyroid CDE) offsite for more than the immediate site area	HS6.1 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve actual or likely major failures of plant functions needed for protection of the public or HOSTILE ACTION that results in intentional damage or malicious acts; (1) toward site personnel or equipment that could lead to the likely failure of or; (2) that prevent effective access to equipment needed for the protection of the public. **ANY** releases are **not** expected to result in exposure levels which exceed EPA Protective Action Guideline exposure levels (1,000 mRem TEDE or 5,000 mRem thyroid CDE) beyond the SITE BOUNDARY	HA6.1 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which involve an actual or potential substantial degradation of the level of safety of the plant or a security event that involves probable life threatening risk to site personnel or damage to site equipment because of HOSTILE ACTION. **ANY** releases are expected to be limited to small fractions of the EPA Protective Action Guideline exposure levels (1,000 mRem TEDE or 5,000 mRem thyroid CDE)	HU6.1 1 2 3 4 5 D Other conditions exist which in the judgment of the Emergency Director indicate that events are in progress or have occurred which indicate a potential degradation of the level of safety of the plant or indicate a security threat to facility protection has been initiated. **No** releases of radioactive material requiring offsite response or monitoring are expected unless further degradation of safety systems occurs
E ISFSI		None	None	None	EU1.1 1 2 3 4 5 D Damage to a loaded cask CONFINEMENT BOUNDARY as indicated by measured dose rates > then **ANY** of the following: • 400 mRem/hr at 3 feet from the HSM surface • 100 mRem/hr outside HSM door on centerline • 20 mRem/hr end shield wall exterior

		General Emergency	Site Area Emergency	Alert	Unusual Event
C Cold SD/ Refuel System Malfunct.	1 Loss of AC Power	**Table C-1 AC Power Sources** Onsite: • 2EGS*EG1 • 2EGS*EG3 Offsite: • Reserve Transformer A • Reserve Transformer B • Aux Boiler Transformer		CA1.1 4 5 D Loss of **all** offsite and **all** onsite AC power, Table C-1, to 4.16 KV emergency buses 2ENS*SWG101 and 2ENS*SWG103 for ≥ 15 min. (Note 4)	CU1.1 4 5 D AC power capability to 4.16 KV emergency buses 2ENS*SWG101 and 2ENS*SWG103 reduced to a single power source, Table C-1, for ≥ 15 min. (Note 4) **AND** **ANY** additional single power source failure will result in a loss of **all** power to 4.16 KV emergency buses 2ENS*SWG101 and 2ENS*SWG103
	2 Loss of DC Power			None	CU2.1 4 5 < 105 VDC on **required** 125 VDC emergency buses for ≥ 15 min. (Note 4)
	3 RPV Water Level	CG3.1 4 5 RPV level < -14 in. for ≥ 30 min. (Note 4) **AND** **ANY** Containment Challenge Indication, Table C-3	CS3.1 4 5 With CONTAINMENT CLOSURE **not** established, RPV water level < 11.8 in.	CA3.1 4 5 RPV water level < 17.8 in. **OR** RPV water level **cannot** be monitored for ≥ 15 min. with **ANY** UNPLANNED RPV leakage indication, Table C-2 (Note 4)	CU3.1 4 RCS leakage results in the inability to maintain or restore RPV water level > 159.3 in. for ≥ 15 min. (Note 4)
		CG3.2 4 5 RPV water level **cannot** be monitored with core uncovery indicated by **ANY** of the following for ≥ 30 min. (Note 4): • **ANY** UNPLANNED RPV leakage indication, Table C-2 • Erratic Source Range Monitor indication **AND** **ANY** Containment Challenge Indication, Table C-3	CS3.2 4 5 With CONTAINMENT CLOSURE established, RPV water level < -14 in. CS3.3 4 5 RPV water level **cannot** be monitored for ≥ 30 min. (Note 4) with a loss of RPV inventory as indicated by **ANY** of the following: • **ANY** UNPLANNED RPV leakage indication, Table C-2 • Erratic Source Range Monitor indication		CU3.2 5 UNPLANNED RPV water level drop below **EITHER** of the following for ≥ 15 min. (Note 4): • 364 in. (RPV flange) • RPV water level band (when the RPV water level band is established below the RPV flange) CU3.3 5 RPV water level **cannot** be monitored with a loss of RPV inventory as indicated by **ANY** UNPLANNED RPV leakage indication, Table C-2
		Table C-2 RPV Leakage Indications • Drywell equipment drain sump level rise • Drywell floor drain sump level rise • Reactor building equipment sump level rise • Reactor Building floor drain sump level rise • Suppression Pool level rise • UNPLANNED rise in RPV make-up rate • Observation of UNISOLABLE RCS leakage			
	4 RCS Temp.	**Table C-3 Containment Challenge Indications** • CONTAINMENT CLOSURE **not** established • Explosive mixture exists inside Primary Containment (H_2 ≥ 6% and O_2 ≥ 5%) • UNPLANNED rise in Primary Containment pressure • RB area radiation > 8.00E+3 mR/hr		CA4.1 4 5 An UNPLANNED event results in **EITHER**: RCS temperature > 200°F for > Table C-4 duration **OR** RPV pressure increase > 10 psi due to an UNPLANNED loss of decay heat removal capability	CU4.1 4 5 UNPLANNED event results in RCS temperature > 200°F CU4.2 4 5 Loss of **all** RCS temperature and RPV water level indication for ≥ 15 min. (Note 4)
	5 Inadvertent Criticality				CU5.1 4 5 An UNPLANNED sustained positive period observed on nuclear instrumentation
	6 Comm.	**Table C-4 RCS Reheat Duration Thresholds** * If an RCS heat removal system is in operation within this time frame and RCS temperature is being reduced, the EAL is **not** applicable RCS Status / CONTAINMENT CLOSURE Status / Duration: INTACT / N/A / 60 min.* **Not** INTACT / Established / 20 min.* **Not** INTACT / **Not** established / 0 min.		**Table C-5 Communications Systems** System / Onsite (internal) / Offsite (external): PBX (normal dial telephones) / X / X Gaitronics / X / Station radio (portable) / X / Control Room installed satellite phones (non portable) / / X ENS / / X RECS / / X	CU6.1 4 5 D Loss of **all** Table C-5 onsite (internal) communication methods affecting the ability to perform routine operations **OR** Loss of **all** Table C-5 offsite (external) communication methods affecting the ability to perform offsite notifications

EAL Identifier

XXX.X

- Category (R, H, E, S, F, C)
- Emergency classification (G, S, A, U)
- Sequential number within subcategory/classification
- Subcategory number (1 if no subcategory)

Modes: 1 Power Operation; 2 Startup; 3 Hot Shutdown; 4 Cold Shutdown; 5 Refuel; D Defueled

Constellation Energy

Nine Mile Point Nuclear Station Unit 2

EPIP-EP-002
Attachment 1
EAL Matrix Unit 2
Page 2 of 2

Approved: _____ Director, Emergency Planning _____ Date

MODE 4, 5 or D

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