



# Decommissioning San Onofre

Nuclear Generating Station

# Community Engagement Panel

October 9, 2014

Emergency Planning for San Onofre



Decommissioning  
**San Onofre**  
Nuclear Generating Station

# Decommissioning Principles

## *Safety*

## *Stewardship*

## *Engagement*

*For more information on SONGS Emergency Planning please visit  
[www.SONGScommunity.com](http://www.SONGScommunity.com)*



Decommissioning  
San Onofre  
Nuclear Generating Station

# Basis for Permanently Defueled Emergency Plan

## Basis

- 10CFR50.47(b): “Emergency Plans”
- 10CFR50 Appendix E: “Emergency Planning and Preparedness for Production and Utilization Facilities”
- NUREG-0654/FEMA-REP-1: “Criteria for Preparation of Radiological Emergency Response Plans and Preparedness of Nuclear Power Plants”
- NSIR/DPR-ISG-02: “Emergency Planning Exemption Requests for Decommissioning Nuclear Power Plants”

## Background and Purpose

- Plan for responding to emergencies to minimize damage to property
- Off-site response organizations will maintain emergency management plans to implement off-site protective measures in the event of a beyond design bases event
- Describes process for communication with off-site response organizations
- Plan covers conditions when used nuclear fuel is stored in the Independent Spent Fuel Storage Installation (ISFSI) or in the Spent Fuel Pool
- For the few remaining possible events, pre-planned response measures are maintained for on-site areas only



Decommissioning  
**San Onofre**  
Nuclear Generating Station

# NRC Interim Staff Guidance

## Basis

- Nuclear Regulatory Commission (NRC) Emergency Planning (EP) guidance for decommissioning
- Interim Staff Guidance (ISG) provides the technical bases for NRC approval of EP exemptions which includes:
  - Radiological releases do not exceed the limits of the U.S. Environmental Protection Agency's (EPA) Protective Action Guidelines (PAGs) at the site's boundary
  - Spent fuel will not reach the zirconium ignition temperature in fewer than 10 hours
- ISG applies to facilities that:
  - Have notified the NRC that it has permanently ceased operation(s)
  - Have certified permanent removal of fuel from the reactor vessel
  - Storing used nuclear fuel in a Spent Fuel Pool

# Accident Analysis: Operating versus Decommissioned

## Operating Reactor

- Potential accidents that create the possibility of a radiological releases are:
  - High pressure steam line breaks
  - Reactor Coolant System line breaks
  - Control rod ejection with a power excursion and a subsequent loss of coolant
  - Loss of steam generator feedwater, undercooling of the fuel

## Permanently Defueled Reactor

- Hazards are greatly reduced resulting in low probability of an accident
- Primary risk is associated with used nuclear fuel stored in the Spent Fuel Pools
- Risk is reduced:
  - Spent Fuel Pool is at atmospheric pressure and low temperature
  - Heat source is low
  - Significant mitigation time



Decommissioning  
San Onofre  
Nuclear Generating Station

# Spent Fuel Pool Design and Protection

- Robust, thick steel-reinforced concrete walls and stainless steel liner
- Designed for earthquakes and external events
- Contains approximately 500,000 gallons of water, which cools the fuel and provides radiation shielding
- More than 5 days to restore Spent Fuel Pool cooling
- Multiple sources of water available to fill or spray the Spent Fuel Pool
- Security protection and controls



Decommissioning  
San Onofre  
Nuclear Generating Station

# Spent Fuel Zirconium Fire Analysis

- Zirconium is the tube material that encases the uranium fuel in each fuel pin (cladding)
- Spent Fuel Zirconium Fire Analysis:
  - Beyond design bases event occurs that causes the Spent Fuel Pools to drain and uncover the used nuclear fuel
  - Same event causes the fuel building to fail in a way that air cooling of the fuel is prevented after pool draining
  - Analysis shows the fuel cannot heat up to ignition temperature in less than 10 hours
- NRC Interim Staff Guidance, 10 hour minimum window is sufficient for plant operators to take mitigating actions and communicate with off-site agencies



Decommissioning  
San Onofre  
Nuclear Generating Station

# Spent Fuel Zirconium Fire Analysis Conclusions

- August 2013, it would take more than 10 hours to reach the zirconium fire temperature
- October 2014, SONGS has more than 17 hours to reach the zirconium fire temperature
- With air cooling, fuel never reaches the temperature to initiate a zirconium fire



Decommissioning  
San Onofre  
Nuclear Generating Station

# Spent Fuel Pool Mitigating Strategies

- Permanently installed plant equipment available to fill or spray the Spent Fuel Pool:
  - Normal Spent Fuel Pool cooling and fill systems
  - Approximately 1.5 million gallons of tank capacity
  - Two electric-driven fire pumps and one diesel engine-driven fire pump are available
- On-site “portable” equipment available to fill or spray the Spent Fuel Pool :
  - Two portable engine-driven pumps are maintained as part of SONGS Spent Fuel Pool mitigation strategies
  - Equipment is pre-staged or stored at a location near the connection points for refill of the Spent Fuel Pool
  - Additional near-site equipment that could be used to fill the Spent Fuel Pool includes Camp Pendleton fire truck(s), which are available to provide support in a timely manner
- Multiple sources of electrical power

# Spent Fuel Pool Mitigating Strategies Conclusion

- Spent Fuel Zirconium Fire Analysis Conclusion
  - 17 hours for San Onofre to take action, in the worst case scenario
- Actual Performance and Capability
  - San Onofre can mitigate events in both Spent Fuel Pools within 2 hours



Decommissioning  
San Onofre  
Nuclear Generating Station

# Interjurisdictional Planning Committee Responsibilities

- The IPC is comprised of representatives of the counties of Orange and San Diego, the cities of Dana Point, San Clemente, and San Juan Capistrano, the Camp Pendleton Marine Corps Base, the State Department of Parks and Recreation, and the Southern California Edison Company
- The IPC maintains integrated plans and procedures to ensure that prompt and effective actions occur to protect the health and safety of the public
- Participates in drills and exercises with SONGS
- Conducts monthly meetings to ensure preparedness and response of emergency plans are well integrated
- SCE is committed to continued funding of the IPC



# Permanently Defueled Emergency Plan Responsibilities

Decommissioning  
San Onofre  
Nuclear Generating Station

| Organization          | Responsibilities   |
|-----------------------|--|
| SONGS                 | <ul style="list-style-type: none"> <li>Control and operation of station activities</li> <li>Mitigate emergency condition</li> <li>Protect station personnel</li> <li>Classify emergency event</li> <li>Assess and monitor radiological conditions</li> <li>Notify federal, state and local agencies</li> <li>Coordinate emergency support for fire, security and rescue/first aid</li> </ul> |
| <b>Local Agencies</b> |  |
| Orange County         | <ul style="list-style-type: none"> <li>Orange County Sheriffs Department is responsible for off-site coordination and response in unincorporated Orange County. Activates Emergency Operations Centers (EOC) at an Alert declaration</li> <li>Member of the IPC</li> </ul>   |
| San Diego County      | <ul style="list-style-type: none"> <li>San Diego County Office of Emergency Services is the lead governmental agency for off-site coordination and response in San Diego County. Activates EOC at an Alert declaration</li> <li>Member of the IPC</li> </ul>   |



Decommissioning  
San Onofre  
Nuclear Generating Station

# Permanently Defueled Emergency Plan Responsibilities Continued

| Organization                                  | Responsibilities   |
|---|--|
| State Agency:                                 |  |
| Governor's Office of Emergency Services (OES) | <ul style="list-style-type: none"><li>• Designated state authority for coordination of all state level response</li><li>• Primary state response agency that coordinates the state's response to requests for assistance from local jurisdictions</li><li>• Member of IPC</li></ul>  |
| Federal Agencies:                             |  |
| NRC   | <ul style="list-style-type: none"><li>• Assess licensee emergency plans for adequacy</li><li>• Make decisions with regard to the overall state of emergency preparedness and issuance of operating licenses</li><li>• Coordinates with other federal response agencies</li><li>• Acts as the lead federal agency with regard to technical response during a nuclear incident including radiological assistance</li></ul> |



Decommissioning  
San Onofre  
Nuclear Generating Station

# Permanently Defueled Emergency Plan Responsibilities Continued

| Organization                          | Responsibilities  |
|---------------------------------------|---|
| Federal Agencies continued:           |   |
| Department of Homeland Security (DHS) | <ul style="list-style-type: none"> <li>Responsible for the overall coordination of a “multi-agency” federal response to a radiological incident</li> <li>Primary role is to support local agencies by coordinating delivery of federal non-technical assistance</li> </ul>        |
| Marine Corps Base, Camp Pendleton     | <ul style="list-style-type: none"> <li>Provides fire, medical and rescue response to SONGS. Participates in annual drills</li> <li>Member of IPC</li> </ul>   |
| Federal Bureau of Investigation (FBI) | <ul style="list-style-type: none"> <li>Acts as the lead agency for the coordination of law enforcement agencies responding to security related events at the SONGS</li> <li>Response actions to security events are addresses in the SONGS Safeguards Contingency Plan</li> </ul> |



# Decommissioning San Onofre

Nuclear Generating Station

# CEP Comments & Questions