

# **Evaluation of Risk From a Property Insurance Perspective**

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# Risk From a Property Insurance Perspective

- Brief Overview of Nuclear Electric Insurance Limited (NEIL)
- Review of Traditional Property Insurance Risk Evaluation Methods
- Efforts to Better Quantify Insurance Risk
- Review of Several Significant Non-Nuclear Safety Property Damage Events at Nuclear Power Plants

# Nuclear Electric Insurance Limited (NEIL)

- Mutual Insurance Company
- Established in 1973 to Provide Coverage For Nuclear Power Plants (NPPs) in the United States
- Two Types of Coverage:
  - Property Damage and Decontamination - \$2.75 Billion
  - Accidental Outage (Business Interruption) - \$490 Million
- All U.S. NPPs Insured By NEIL
- Dublin, Ireland Based Subsidiary Established 1998 - Overseas NEIL Limited (ONEIL)
  - Coverage for NPPs Outside of U.S.



# Property Insurance Risk

- Property Insurance Risk At NPPs Involves More Than the Nuclear Safety Risk (i.e - Core Damage)
- Potential For Other Lesser Magnitude, But Financially Significant Events Must Be Evaluated
- Any Accidental Event Causing Damage To Plant Property or Equipment Typically Covered

# Property Insurance Risk

- For Insurance Purposes, “Accidents” Not Limited To Nuclear Events
- Accident – Any Unforeseen or Unexpected Event That Causes Damage To Plant Property or Equipment
- Damage That Occurs Over Time Is Not Considered Accidental
  - Erosion, Corrosion, Cracking, Gradual Accumulation of Radioactive Contamination, etc.

# Property Insurance Risk

- An Event Causing Damage To Nuclear Fuel Would Probably Result In Maximum Insurance Payout
  - On-Site Decontamination and Clean-Up
  - Debris Removal and Disposal
  - Damage Repair and/or Site Restoration
- Likelihood Of Such An Event Is Very Remote
- The More Likely Insurance Risk Involves Equipment Failures That Do Not Challenge Nuclear Safety

# Property Insurance Risk Evaluation

- Sophisticated Analysis Tools Have Been Developed To Estimate Nuclear Safety Risk and Consequences Of Core Damage Events
  - PRA and PSA Tools and Methods
- Used By Plant Operators and Regulators To Monitor Nuclear Safety Risk
- Property Insurers Typically Don't Duplicate Work Done By Others
- For Nuclear Safety Issues, Rely On Work Done By:
  - Regulators, IAEA, WANO, INPO, etc.

# Property Insurance Risk Evaluation

- Insurance Risk Evaluations Focus On Balance-of-Plant or Non-Nuclear Safety Areas
- Attempt To Identify Conditions That Could Result In Equipment Failures Leading To Plant Damage or Extended Plant Outages
- Insurance Standards Adopted To Reduce The Risk Of Unexpected Events Causing Damage To Plant Property

# Property Insurance Loss Prevention Standards

- Address Two General Areas: Fire/Property Protection and Machinery Breakdown
- Fire/Property Protection Requirements:
  - Fire Protection Water Supplies
  - Building Construction Features & Materials
  - Fire Suppression Systems
  - Administrative Programs
  - Protection Against the Effects of Natural Events
  - Etc.

# Property Insurance Loss Prevention Standards

- Machinery Breakdown Requirements:
  - Address The Operation, Inspection, and Maintenance of Major Plant Equipment
    - Turbine-Generators
    - Large Pumps, Motors, and Other Rotating Equipment
    - Transformers
    - Diesel Generators
    - Etc.
  - Specify Scope and Frequency of Certain Inspection and Maintenance Activities

# Property Insurance Plant Evaluations

- Periodic On-Site Plant Evaluations Conducted
- Verification of Compliance With Insurance Company Loss Prevention Requirements
- Typical Agenda:
  - Tour of Most Plant Buildings and Areas
  - Review of Status and Readiness of Fire Protection Systems and Equipment
  - Practice Drills Involving the Fire Response Team
  - Review of Major Equipment Operation, Maintenance, and Inspection Records
  - Discussions With Senior Plant Management

# Future Property Insurance Risk Evaluation

- Historical Insurance Requirements Have Been Deterministic
  - Based On Experience or Expert Judgment
  - “Do Something At Some Specified Interval”
  - Actual Risk Has Not Been Quantified
- Probabilistic Tools and Methods Starting To Be Used In Non-Safety Applications
- Insurance Companies Will Use To:
  - Better Quantify Insurance Risk
  - Prioritize Loss Prevention Activities

# Examples of Non-Nuclear Insurance Claims At NPPs

- One Unit at Two-Unit PWR Operating @ 39% Power Following Refueling Outage
- Fault In 4160 V Circuit Breaker Caused:
  - Fire In Breaker Cabinet
  - Partial Loss of AC Off-Site Power
  - Automatic Reactor Shutdown
- Failure of DC Breaker Caused Unavailability of Turbine Emergency Lube Oil System
  - Turbine Generator Coasted Down Without Lubrication
- Insurance Claim: Approx. \$60 Million (US)

# Examples of Non-Nuclear Insurance Claims At NPPs

- Single Unit BWR Operating At 93% Power
- Failure of Low Pressure Turbine Blade
- Excessive Vibration Caused Hydrogen Leaks, Lube Oil Leaks, and Fires
- Other Turbine Blades Penetrated Condenser Causing Flooding In Turbine and Radwaste Buildings
- Significant Damage To Turbine-Generator and Exciter Resulted In:
  - One Year Outage
  - Insurance Claim: \$183 Million (US)

# Examples of Non-Nuclear Insurance Claims At NPPs

- Category 4 Hurricane Passed Directly Over Two-Unit PWR (Also Two Fossil Units On the Site)
- Nuclear Plants Sustained Relatively Little Damage
- Significant Damage To Ancillary Buildings and Fossil Units
- Total Insurance Claim: \$144 Million (US)
  - \$80 Million Associated With Nuclear Warehouse

# Conclusion

- Most Property Insurance Claims Involve Conventional or Non-Nuclear Equipment
- Property Insurance Risk Evaluation Activities Focus Primarily On Non-Nuclear Issues
- Nuclear Safety **MUST** Continue To Be the Principal Focus for Nuclear Plant Operators
- Minimizing Risk of Non-Nuclear Equipment Damaging Events Will Help Assure Plant Reliability and Long-Term Economic Viability