

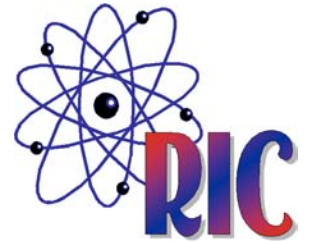
# **RIC 2004**

## **Grid Stability / Next Steps**

### **Session W4**

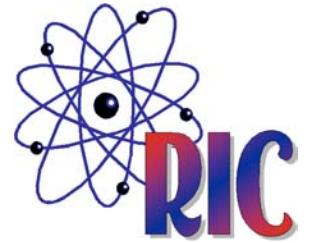
**Grid Stability**  
**Cornelius Holden**  
**Project Director**  
**U.S. Nuclear Regulatory Commission**  
**March 10, 2004**





# August 14, 2003

- Major Grid Outage in Northeast
- 62,000 Megawatts Lost
- International Task Force
- 9 U.S. Nuclear Plants Trip in Response to Grid Conditions



# Joint Task Force

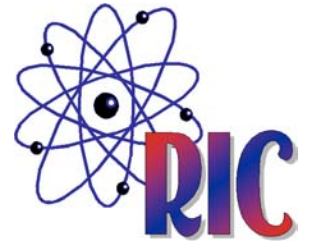
## Three Working Groups

Electric System Working Group

Nuclear Working Group

Security Working Group

# Roles and Responsibilities

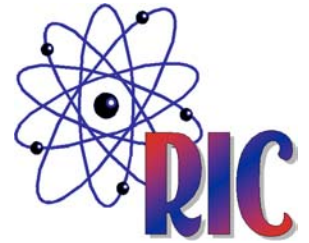


NRC – Federal agency that regulates civilian uses of nuclear materials.

FERC – Federal agency that regulates transmission and wholesale sales of electricity.

NERC – Non-government entity that develops transmission system operating standards and monitors compliance, but has no enforcement authority.

# Roles and Responsibilities



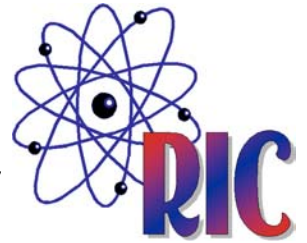
Transmission System Owners – companies that own transmission assets, finance capital improvements

Control Area Operators – balance generation and load, comply with NERC standards (about 140 in U.S.)

Reliability Coordinators – provide reliability oversight for the CAOs over a wide region (18 in North America)

Independent System Operators – manage the operation of electricity markets, comply with FERC regulations

# NRC General Design Criteria 17

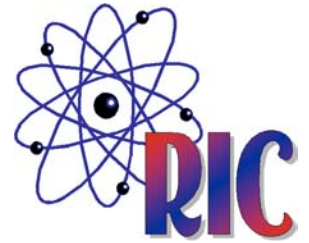


Offsite Power shall:

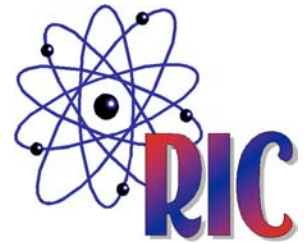
- Provide sufficient capacity and capability
- Supplied by 2 physically independent circuits
- One circuit available within a few seconds
- Minimize probability of losing electric power from remaining supplies coincident with loss of one supply

# Loss of All AC Power

## 10 CFR 50.63

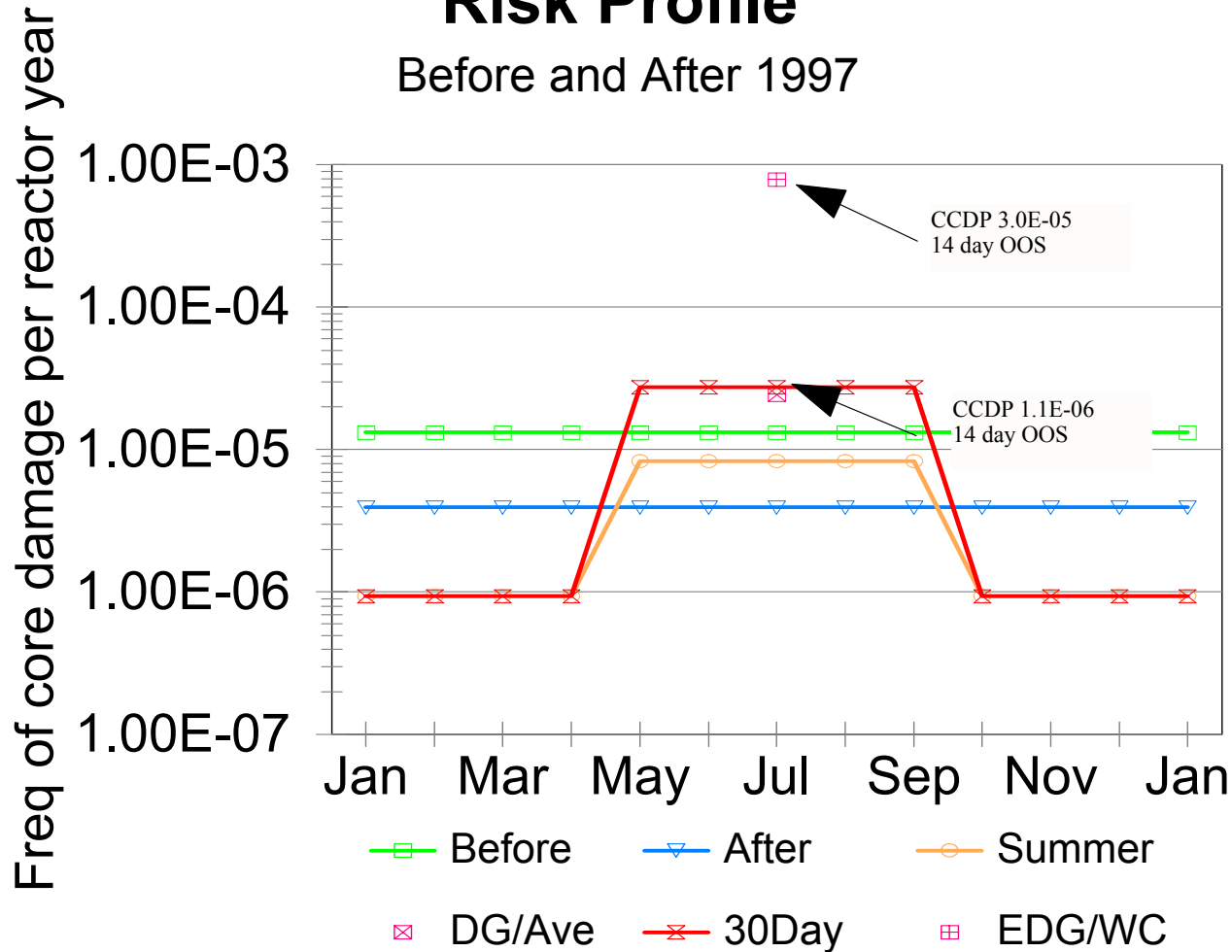


- Withstand and recover from a Station Blackout
- Coping duration depends on:
  - Expected frequency of Loss of Offsite Power
  - Reliability of Emergency Diesel Generators
  - Probable time to restore offsite power
  - Redundancy of onsite emergency sources



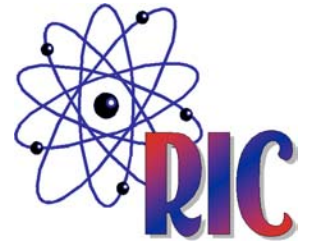
# Risk Profile

## Before and After 1997



Ref: NUREG 1784, Operating Experience Assessment – Effects of Grid Events on Nuclear Power Plant Performance.





# Summary

- August 14<sup>th</sup> Loss of Offsite Power Event Tripped 9 Nuclear Plants
- Although the Number of LOOPs Has Decreased, the Length Has Increased
- Plant Maintenance Should Include Impact of Grid Condition