Union of Concerned Scientists

# Perspectives on the Implementation of Fukushima Lessons Learned

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**(Fukushima plus 5 11/12 years)**

# Implementation? Or Illusion?

**NRC's post-Fukushima orders, fleshed out by industry's guides and NRC's regulatory guidance documents, map out a course to better protect against beyond design basis events.**

# Are We There Yet?

# Flood Protection

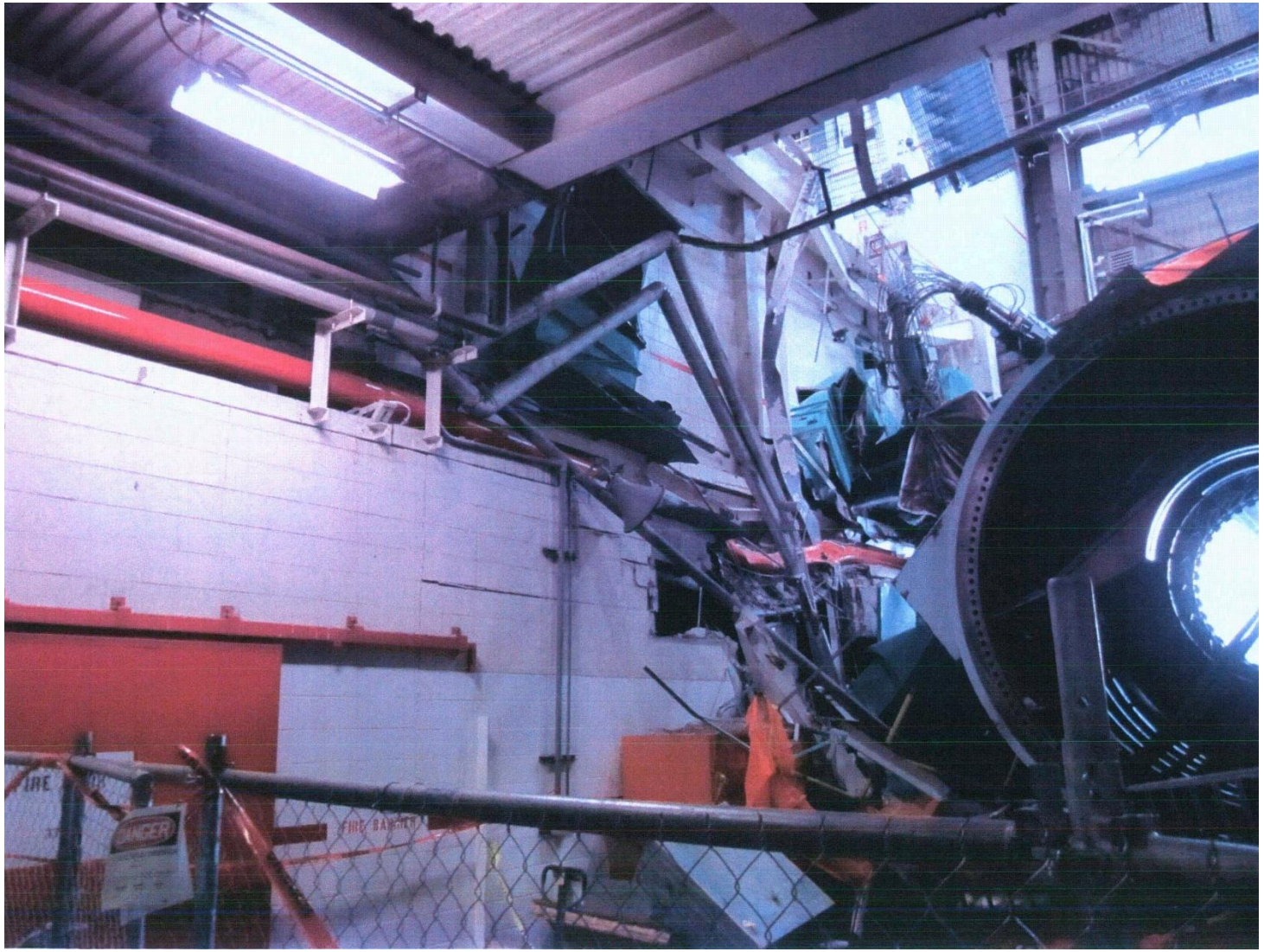
**NRC's post-Fukushima flood protection mandate* built upon longstanding regulatory requirements and operating experience.**

*** Source: 50.54(f) Request for Information (ML12053A340)**

# NRC Got Fort Calhoun There

**Source: ML120400493**

# ANO Was Not There



**Source: ML14219A433**

# ANO Was Not There

**"...there were more than 100 unknown ingress pathways for a flooding event..."**

**"The unexpected rate of flooding would likely be beyond the licensee's capability to prevent or mitigate as equipment and connections associated with alternative mitigating strategies could be submerged."**

**"...the licensee did not design, construct, and/or maintain over 100 barriers to ensure design margins were sustained."**

**Source: NRC letter dated 09/09/2014 (ML14253A122)**

# St. Lucie Was Not There

**Source: ML16236A019**

# St. Lucie Was Not There

- **"Approximately 50,000 gallons of water entered the -0.5 foot elevation of the RAB through two degraded conduits in the ECCS pipe tunnel which were severely corroded and lacked internal flood barriers."**
- **"After the [January 9, 2014] event, the licensee identified four additional conduits in the ECCS pipe tunnel without internal flood barriers…".**

**Source: NRC letter dated 09/24/2014 (ML1426A337)**

# St. Lucie Was Not There

- **"The licensee evaluated the missing flood barriers and concluded that a design basis external flood event would have allowed water to enter the Unit 1 RAB and potentially impact both trains of high head and low head ECCS pumps."**
- **"The licensee also concluded that modifications implemented in 1978 and 1982 had installed the six conduits below the design basis flood elevation without internal flood barriers."**

**Source: NRC letter dated 09/24/2014 (ML1426A337)**

# Where Are the Others?

U.S.NRC
United States Nuclear Regulatory Commission
*Protecting People and the Environment*

## Observations from Walkdown Reports

- Approximately 90% of licensees entered an issue into its Corrective Actions Program
- Common issues identified include:
  - Inadequate procedures
  - Flood protection features that may not perform as planned
  - Degraded or missing seals

**Source: NRC Slides 11/12/2013 (ML13311A268)**

# Mitigating Strategies

**NRC's post-Fukushima mitigating strategies mandate* built upon fewer and more recent regulatory requirements and operating experience.**

**Consequently, there's even less confidence that any reactor is really there.**

*** Source: Order (ML12054A735)**

# Are We There Yet?

**Success entails mapping a proper course and reaching its destination.**

**NRC has mapped out proper courses for flood protection and mitigating strategies.**

**There's insufficient evidence to conclude that all reactors have reached the proper destination.**

# Are We There Yet?

**To ensure/verify the answer is Yes, UCS recommends that the NRC conduct 8 vertical slice inspections:**

- **One vertical slice inspection in each region of flood protection measures**
- **One vertical slice inspection in each region (not the same sites as above) of mitigating strategies measures**

# List of Acronyms

**ANO – Arkansas Nuclear One**

**ECCS – emergency core cooling systems**

**NRC – Nuclear Regulatory Commission**

**RAB – reactor auxiliary building**

**UCS – Union of Concerned Scientists**