

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**PRESENTATION TO
THE NUCLEAR WASTE TECHNICAL REVIEW BOARD**

**SUBJECT: A BRIEF HISTORY OF
PERFORMANCE ASSESSMENT IN
THE YUCCA MOUNTAIN PROJECT**

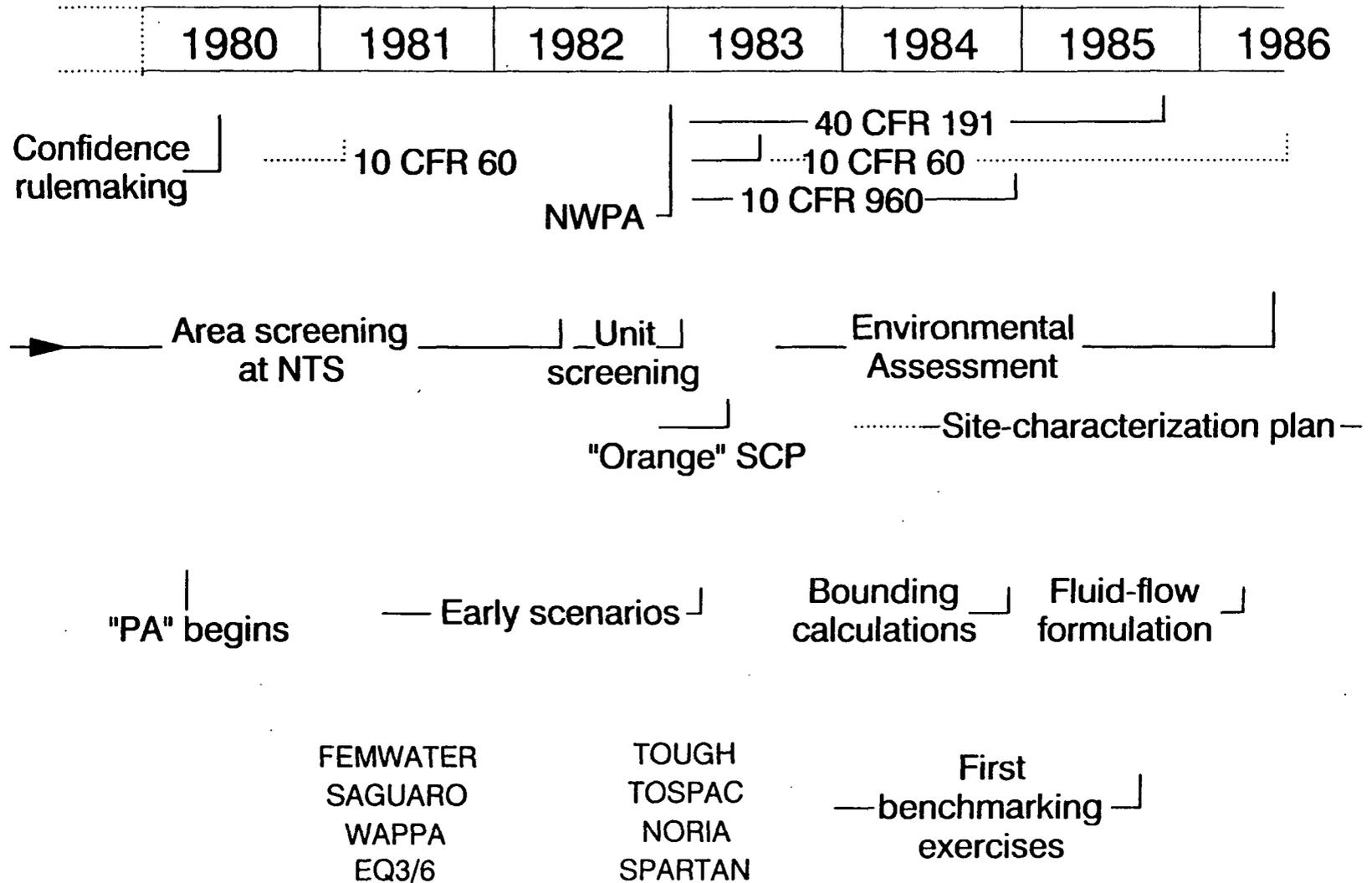
PRESENTER: DR. FELTON W. BINGHAM

**PRESENTER'S TITLE
AND ORGANIZATION: SUPERVISOR, DIVISION 6312
SANDIA NATIONAL LABORATORIES
ALBUQUERQUE, NEW MEXICO**

**PRESENTER'S
TELEPHONE NUMBER: (505) 844-8816**

**ARLINGTON, VIRGINIA
MAY 20-21, 1991**

The Age of Innocence



THE AGE OF INNOCENCE

What It Was Like

Small group of participants

Research-like atmosphere

- **"Traditional" peer review**
- **Emphasis on publication**

Little formal control

Belief that the license application was imminent

Growing understanding of PA

- **But PA doesn't drive the project**

Similarities to international research programs

- **E.g., interest in natural analogs**

THE AGE OF INNOCENCE

Accomplishments

Recognition of technical issues

- Main site features**
- Need for valid conceptual models**
- Fracture-matrix interactions**

Bounding calculations

Computer codes

- Largely in place**

THE AGE OF INNOCENCE

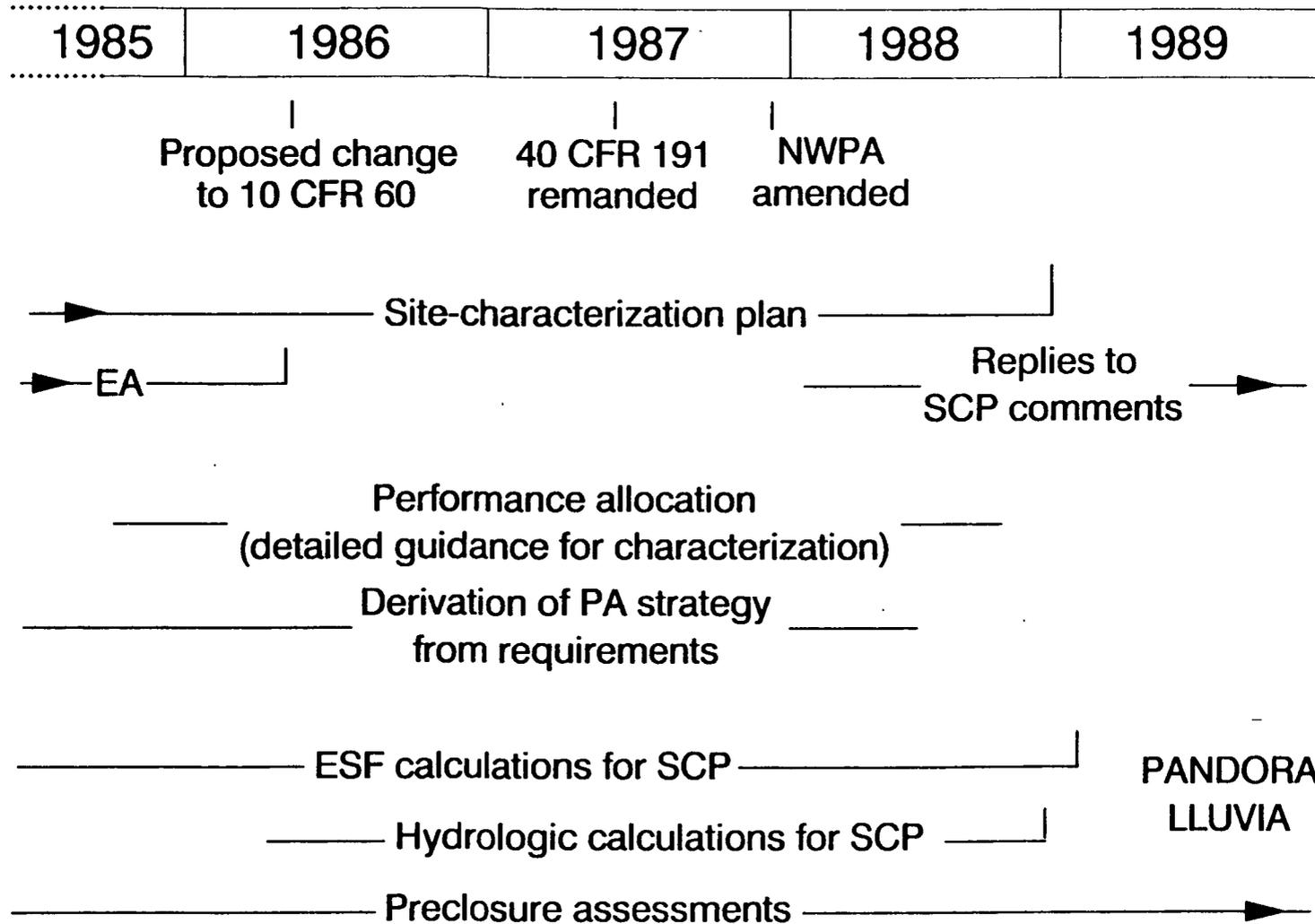
Expectations at the End of the Age

"In making the EA, we have thoroughly reviewed our project and have unified PA with design and site characterization."

"PA now knows how to do its job."

"The SCP will be easy because of the Orange SCP and the EA."

The Age of Awakening



THE AGE OF AWAKENING

What It Was Like

Heavy emphasis on the SCP

Decreasing resources for technical analyses

Growing number of participants

"Nontraditional" atmosphere

- Reviews increasingly from outside project**
- Reviews by large ad hoc groups**

Increasing formality of control

New understanding of relationship with NRC

- Less technical than had been expected**

Increasing cooperation with PA

THE AGE OF AWAKENING

Accomplishments

Completion of difficult SCP tasks

- Issue-resolution strategies**
- Performance allocation**
- Some NRC agreements: e.g., on ESF analyses**

Provision of other technical support to SCP

- Using tools developed in the Age of Innocence**

Some development of capabilities; some completed analyses

- In spite of SCP demands**

THE AGE OF AWAKENING

Expectations at the End of the Age

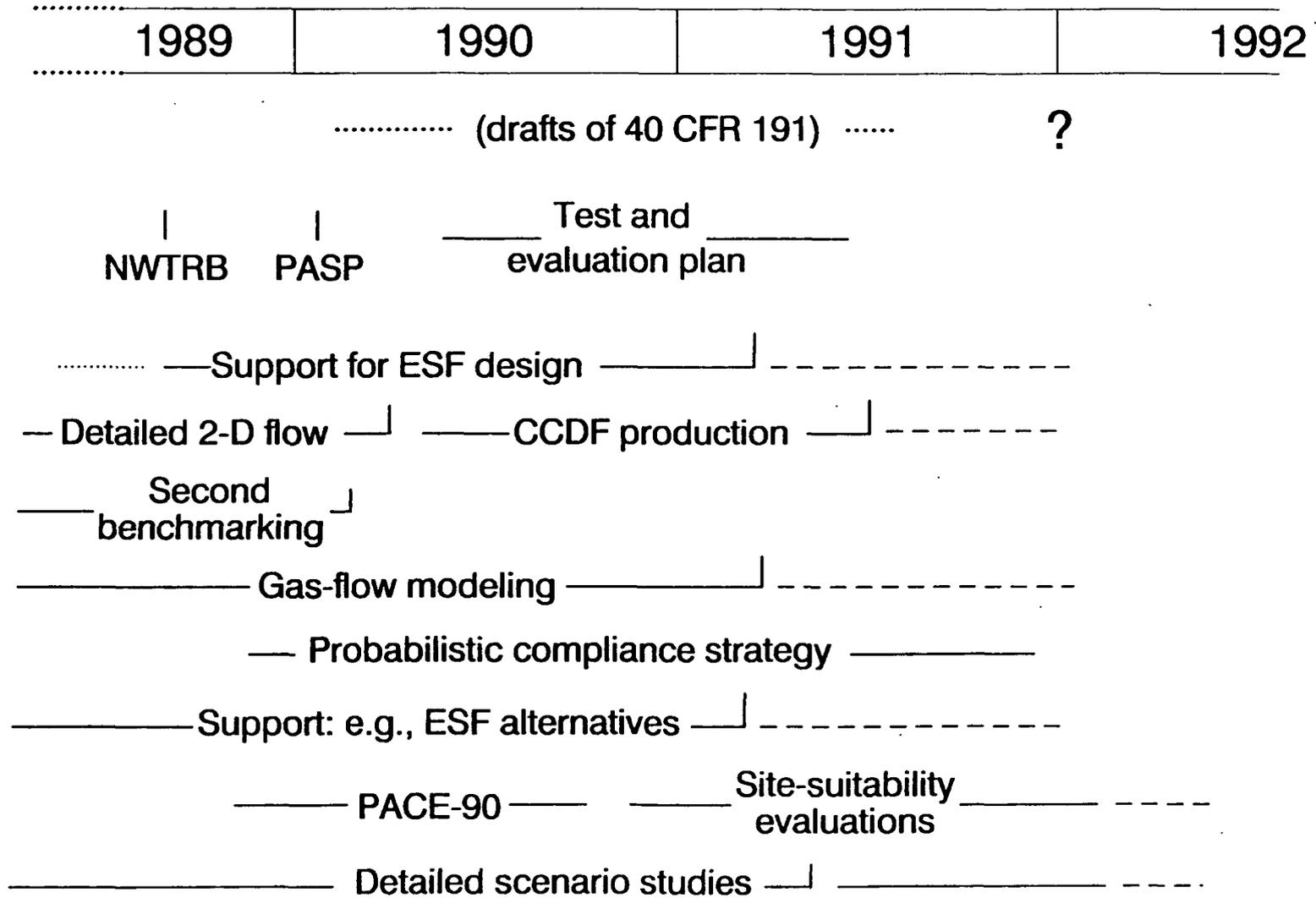
"The increasing control and review may slow us down."

"We've at last begun the long-awaited dialogue with the NRC."

**"Site characterization will soon begin supplying the data
we need."**

"Our strategies have been accepted; now we can get to work."

The Age of Responsibility



THE AGE OF RESPONSIBILITY

What It Is Like

Many more participants (and critics)

Increased expectations of PA

- **Newly required calculations**

Greater reliance on experts, driven by needs for

- **Results without site-characterization data**
- **Greater formality**

Less emphasis on carrying out SCP strategies

Increased availability of site data

- **In spite of delay in site characterization**
- **Due partly to increased cooperation within project**

THE AGE OF RESPONSIBILITY

Accomplishments (A year or two from now?)

Better understanding of the site

- Fracture-matrix interactions**
- Gas flow**
- Features, events, and processes**

Extensive contributions

- ESF design**
- Guidance and review of testing**
- Compliance strategy**

Some progress in carrying out SCP strategies

THE AGE OF RESPONSIBILITY

Expectations at the End of the Age (A year or two from now?)

"PA, design, and site characterization are working together."

"The demands on PA are stretching it thin."