Technology Base for the ACR: FUEL CHANNELS

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Meeting with the USNRC and CNSC
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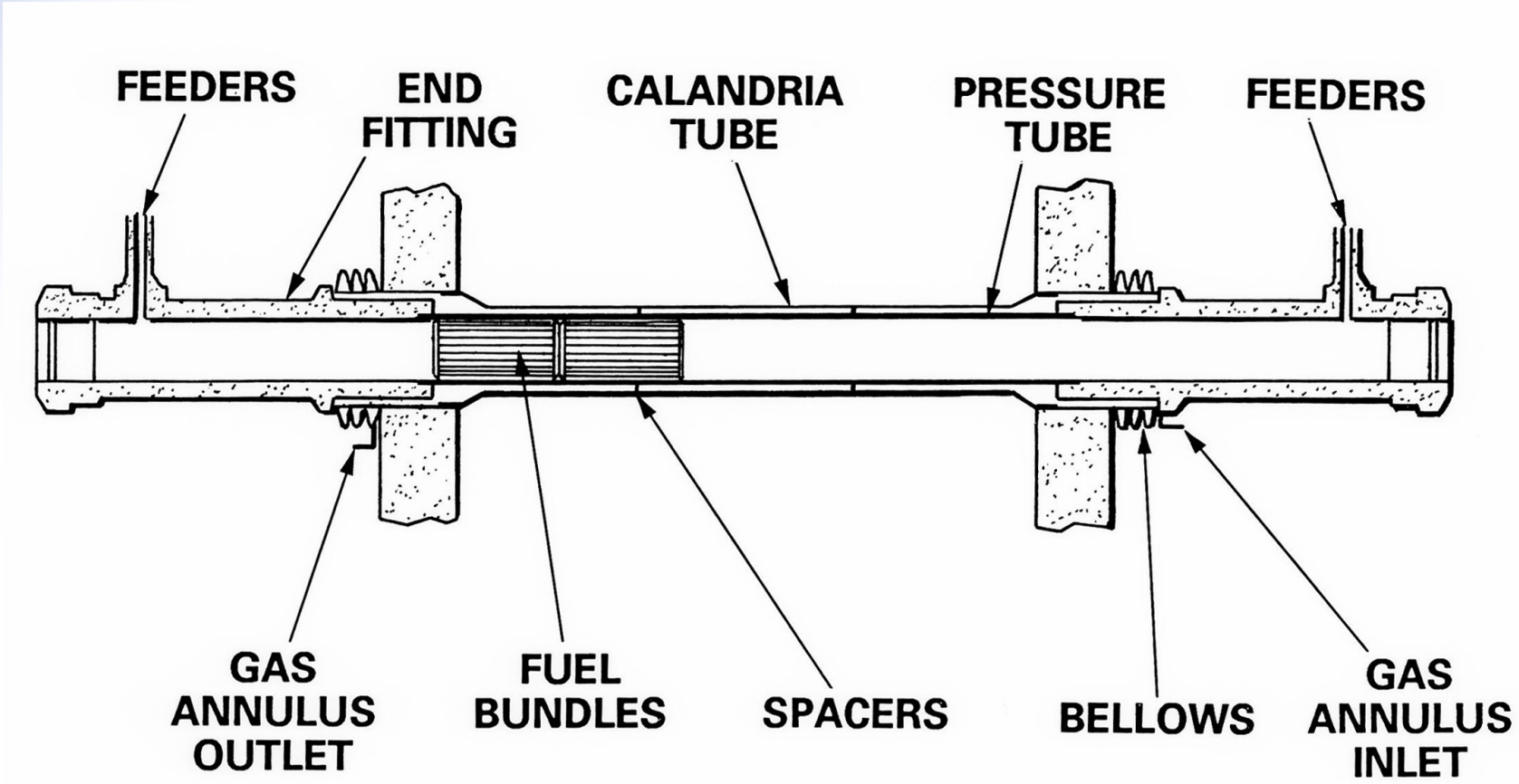
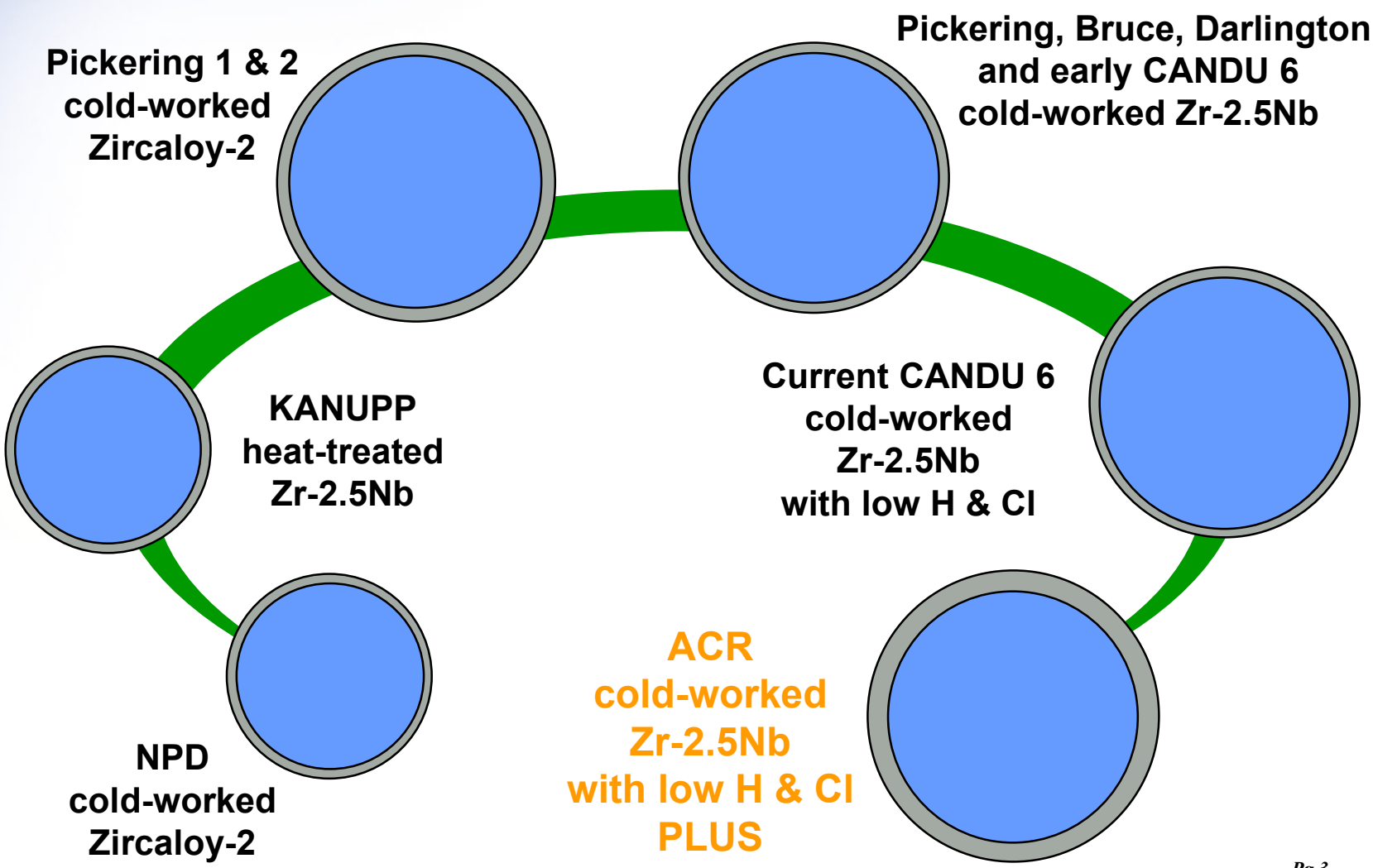
FUEL CHANNEL COMPONENTS



PRESSURE TUBE EVOLUTION



PERSONNEL

- Research and Development
- Project Design
- Station Services
  - Inspection
  - Life Management

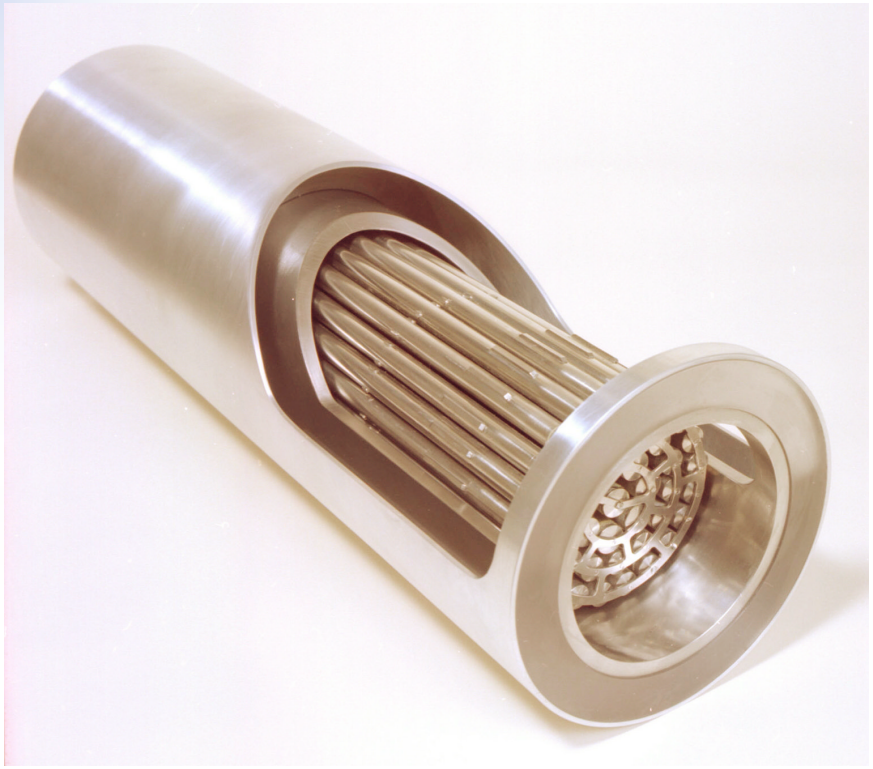
PRESSURE TUBE OPERATING CONDITIONS

Temperature:	~250 to 325°C (482 to 617°F)
Pressure:	~10 to 13 MPa (1450 to 1886 psi)
Neutron Flux:	peak of about $4 \times 10^{17} n.m^{-2}s^{-1}$ E > 1 MeV
Time:	30 years @ 90% capacity

FUEL CHANNEL R&D
5 PROGRAMS

- **Deformation**
- **Corrosion and Hydrogen Ingress**
- **Delayed Hydride Cracking and Fracture**
- Non-Destructive Inspection
- Component Development

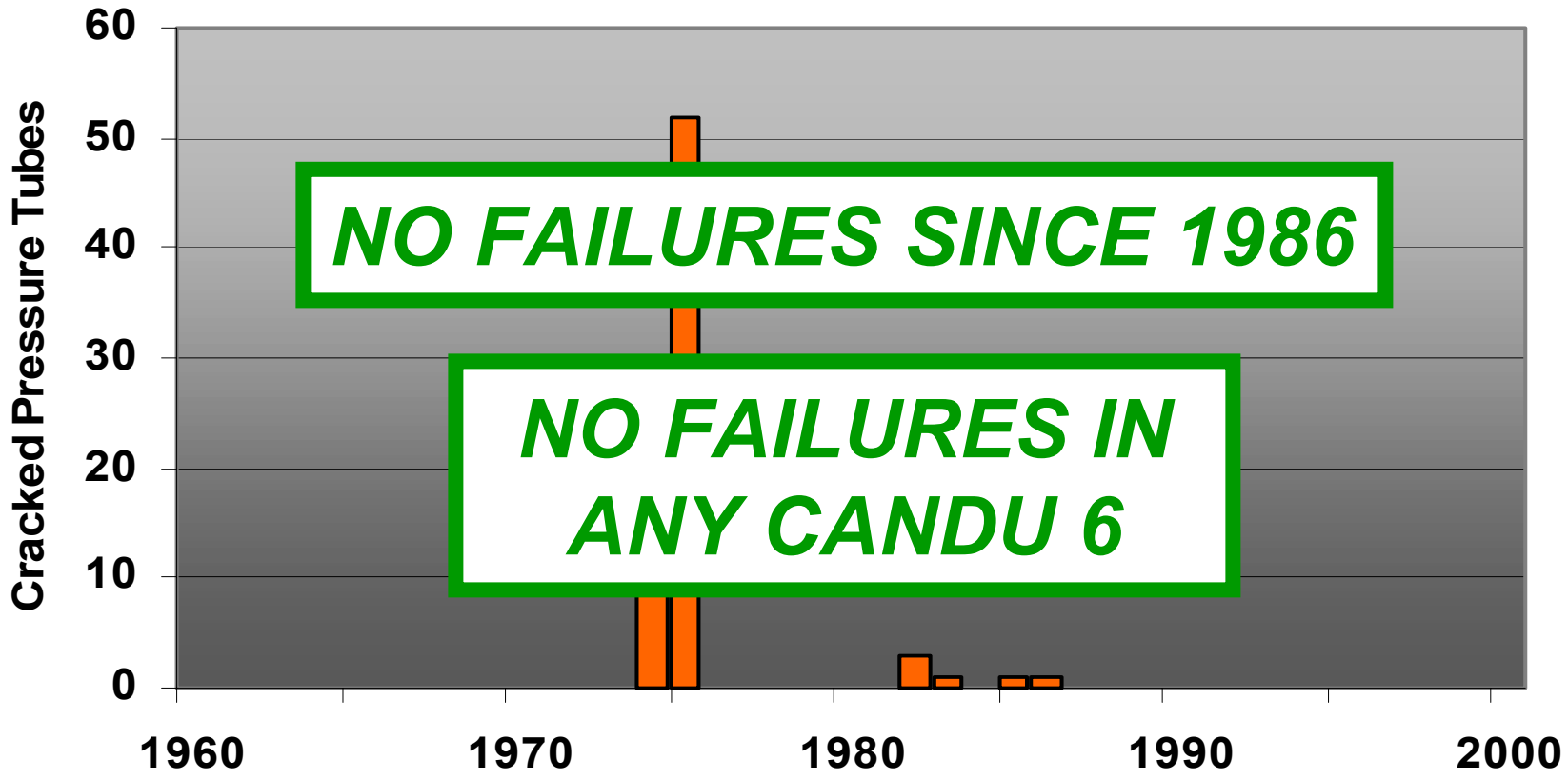
MOTIVATIONS



FOR ALL ASPECTS:

- **Understanding**
- **Predictive Capability**
- **Confirmation**

PERFORMANCE STATISTICS



KEYS TO HIGH PEFORMANCE

- High-Quality Manufacturing
- In-Depth Knowledge and Understanding
- Material Surveillance
- In-Reactor Inspections
- Assessment Methodologies

FUEL CHANNEL PERFORMANCE

- 32 CANDU reactors in 7 countries
- More than 350 reactor years of equivalent full-power operation
- 208 to 480 fuel channels per reactor
- More than 150,000 pressure tube years of equivalent full-power operation
- Thousands of reactor measurements

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