Air Ingress

Needs

- High temperature oxidation of graphite (Data)
- Codes: identification followed by applicability and adequacy demonstration
- Experiments
- Termination of sequence
- Fuel and fission product release
  - In helium
  - Following air ingress
- Applicability of current data base to recent graphite forms
- Determination of initiators
  - Thermal induced fatigue
  - Vibration induced fatigue
  - Seismic
  - Embrittlement
  - Corrosion
  - Failure of turbo-machinery within primary containment

Research Currently Available

- NACOK/Germany=>natural circulation, including graphite oxidation
- Japan/HTTR=>air diffusing into vessel
- N-Reactor flow, chemistry models and experiments (D. Powers)
- Additional tests and code models in Germany (Brinkmann)
- NRC HTGR research program (Silberberg/NRC?)
- Schuten presentation re Chenerbyl and gas reactor
- IAEA technical document 978, summary report
- ORNL report regarding graphite oxidation=>ORSAC code
- Oxidation and fuel failure as a function of temperature (Germany)

Additional Effort Areas

- Testing recent graphite forms
- Particle testing at high temperatures
- Validate codes
- Probabilistic risk assessment
  - Modeling system
  - Success criteria

6/13

Potential Research Areas

1	Air ingress
2	High temperature materials
3	Graphite behavior
4	Fission product release, transport, plateout, etc.
5	Accident performance of Triso fuel
6	Water ingress
7	Reactivity accidents
8	Seismic events
9	Applicability and adequacy of code tools
10	Central pebble bed reflector column
11	Fuel temperature limits and margins
12	Containment performance
13	Chemical attack
14	Equipment aging