Air Ingress

Needs

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- 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)

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Additional Effort Areas

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

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Potential Research Areas

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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

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