Presentation to
NUCLEAR ENERGY ADVISORY COMMITTEE
of the 6 April 2009 Report of the
ANTT Subcommittee

Burton Richter (subcommittee Chair)

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Recommendation

Improve the coupling of the NE program to RW, EM, and SC as well as NNSA. Now that new repository sites are being considered, a close collaboration with RW is particularly important.

Recommendation

Review facility requirements in the light of the new program direction. Some facilities should be designated as user facilities where university programs could have access.

- **Sept 08 NEAC report – facilities are in bad shape.**
- **Our recommendation was built on this report and urged that the ACFI program review its facility needs.**
- **Thought the program is not worked out in detail, enough is known to identify some of the important missing pieces.**

Recommendation

Explore the potential of an international collaboration to develop, fund, and use a fast neutron source and a transient test facility, both of which will eventually be needed for the program.

Ultimately these two costly facilities will be needed to fully evaluate the potential of transmutation to simplify the spent fuel disposal problem. Can they be international?

Recommendation

Clarify the AFCI responsibilities for sodium fast spectrum GEN IV reactor development.

ACFI seems to have been given the responsibility for keeping the sodium fast reactor program going. Is this a long term assignment?

Recommendation

Reevaluate Accelerator Driven Systems (ADS) for minor actinide transmutation.

ADS evaluated as impractical for transmutation of all the actinides (Pu, Np, Am, Cm).

Separating and transmuting the minor actinides (Np, Am, Cm) simplifies closing the fuel cycle in fast reactors, or repository design in once through systems.

Recommendation

Investigate the potential of extracting uranium from sea water, perhaps in collaboration with Japan

IAEA-NEA "Redbook" estimates that 16 million tons of natural uranium are available at a reasonable price from conventional mining sources.

Is there enough Uranium to sustain a long-term LWR program or do we have to switch to breeders before the end of the century?

Recommendation

Include some high-risk, high-payoff elements in the campaigns

Assess the potential of new materials for fuels, reprocessing, and reactors as an element of the new science based program.

The new science based orientation of the program gives the opportunity to take the time to see if new materials and process can pay off

Recommendation

Evaluate the effectiveness of the CAES program in about one year

- **NE has turned over the University grants program and the fellowship program to the Center for Advanced Energy Studies (CAES), a partnership of Idaho National Laboratory, its contractor, and the three Idaho public universities (University of Idaho, Boise State University, and Idaho State University).**
- **We know of no other peer review system like it and recommend that NE have its performance reviewed in about a year to see if it is functioning as it should. There is a potential for conflict of interest here.**