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A NEW PARADIGM FOR HIGH-LEVEL RADIOACTIVE WASTE DISPOSAL

- **The present system is busted. 50 years after immobilization and disposal techniques were demonstrated, Hanford has not vitrified any waste.**
- **With the failure of Yucca Mountain, new laws and regulations are required.**
- **The principles in the NAS Report "Rethinking High-Level Radioactive Waste Disposal" are still valid but the report needs updating because much has been learned about siting and designing disposal of HLW, limiting proliferation opportunities has become more important and the implications of a near doubling of average radiation dose in the U.S. have not been explored.**
- **Unless the desired outcome is clear, a suitable plan to achieve that outcome is not possible. Determining what that outcome should be is difficult because of the many competing values involved.**
    a. **The process must be transparent, sustainable, believable and hopefully successful. Sustainable does not require that we 'solve' the 'problem' in this generation but only that we not leave future generations worse off than us. They shall wish to make their own decisions.**
    b. **Plan, design and build based upon how far in the future we have confidence-say 3 generations-100 years. Examine the options theoretically, by modeling and pilot scale demonstrations. Repeat after each 100 years taking into account all conditions at that time.**
    c. **Those being considered today are surface storage at generation site or a central site, deep geological disposal on land or under the sea, etc. Consider disposal in deep sub-seabed sediments. (DSS)**
    d. **DDS combined with extraction of uranium from the sea would eliminate the need for reprocessing to conserve uranium and reduce the opportunities for proliferation.**
    e. **DDS would increase the radioactive content of the oceans minimally would reduce the impact of radionuclides- no one drinks seawater and there is enormous physical and chemical dilution. Previous studies of this option have shown doses less than 10E-9 Sv/y.**
    f. **To regain trust, harmonize laws and regulations, e.g. different agencies have different dose limitations for the same exposure, for different time periods and different origins of the waste.**
    g. **The average dose from nuclear power activities is 100 times less than that from natural background. Regulations limit doses to less than 1/100th of medical doses. There are no limitations on background and cumulative medical doses.**
    h. **Nuclear war effects overwhelm all other considerations.**
    i. **20 years after Chernobyl, "poverty and socio-economic opportunity are the biggest danger."**
- **No mathematically optimal solutions possible-Clumsy Solutions**
- **Will be difficult**