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FROM RESEARCH TO INDUSTRY

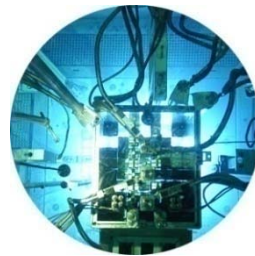
AIEA INTERNATIONAL CONFERENCE RELATED FUEL CYCLES

NUCLEAR PROGRAM IN THE 21st CENTURY

DRIVERS FOR DEPLOYMENT OF SUSTAINABLE AND INNOVATIVE TECHNOLOGY

Christophe Behar- Director For Nuclear Energy

CEA -Alternative Energies and Atomic Energy Commission



Saint-Petersburg

June 29th , 2013

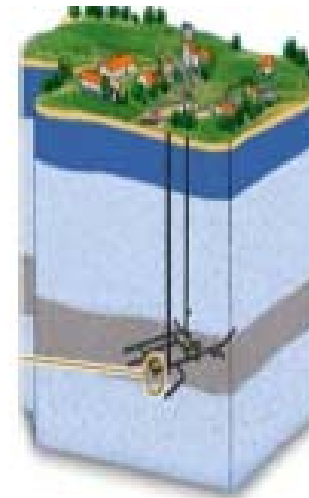
TWO DIFFERENT STRATEGIES

- **CONSIDER SPENT FUEL AS A WASTE**

➔ ***DIRECT DISPOSAL OF SPENT FUEL***

- **CONSIDER SPENT FUEL AS AN ENERGETIC RESOURCE**

➔ ***RECYCLING SPENT FUEL***



RECYCLING STRATEGY MERITS

➤ ECONOMY ON URANIUM USE



➤ ENVIRONMENT PROTECTION

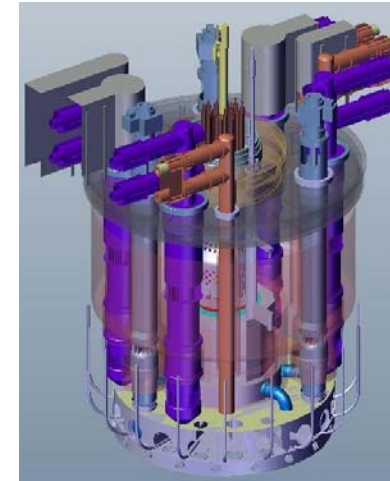
- Current processing process implemented in France at La Hague:
 - Allows recovering 99,99% of U and Pu → 96% of spent fuel
- Significant improvement for waste management
 - Divide by 5 waste volume
 - Divide by 10 waste toxicity
 - Decrease by >10 waste lifetime

FRANCE OPEN TREATMENT-RECYCLING SERVICES TO ANY COUNTRY
FULFILLING ITS INTERNATIONAL COMMITMENT

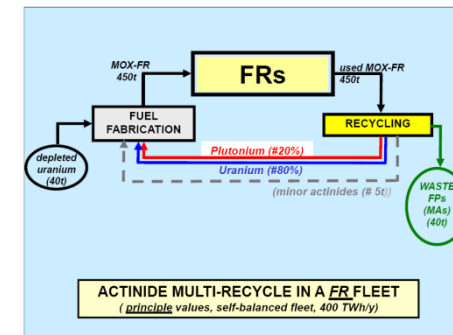
SUSTAINABLE NUCLEAR DEVELOPMENT STAKES

- **MASTERING PLUTONIUM STOCKPILE IN SPENT FUELS**
- **USE THE TOTAL POTENTIAL ENERGETIC OF NATUREL URANIUM**
- **MINIMISE VOLUME AND RADIOTOXICITY OF NUCLEAR WASTE**

➤ FAST NEUTRON REACTORS



➤ ALONG WITH RELATED CLOSE FUEL CYCLE



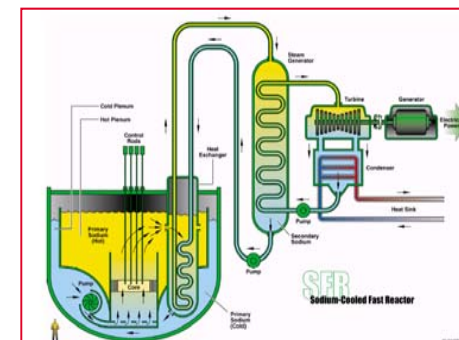
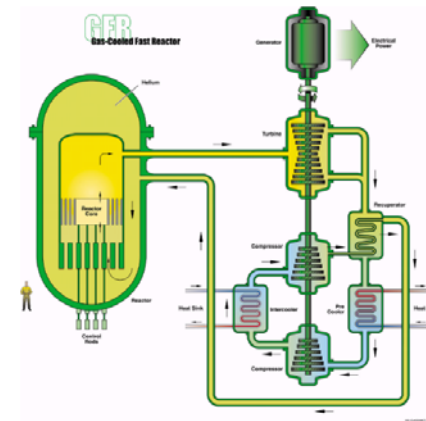
TWO FAST NEUTRON REACTOR TECHNOLOGIES

➤ GAS COOL FAST REACTOR

➔ Association to other European countries

➤ SODIUM COOL FAST REACTOR

➔ Development of the ASTRID prototype in cooperation with industrial partners (domestic and foreign)



Thank you for your attention

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