



Hyperion Power
GENERATION

NWTRB Meeting

Idaho Falls June 29, 2010

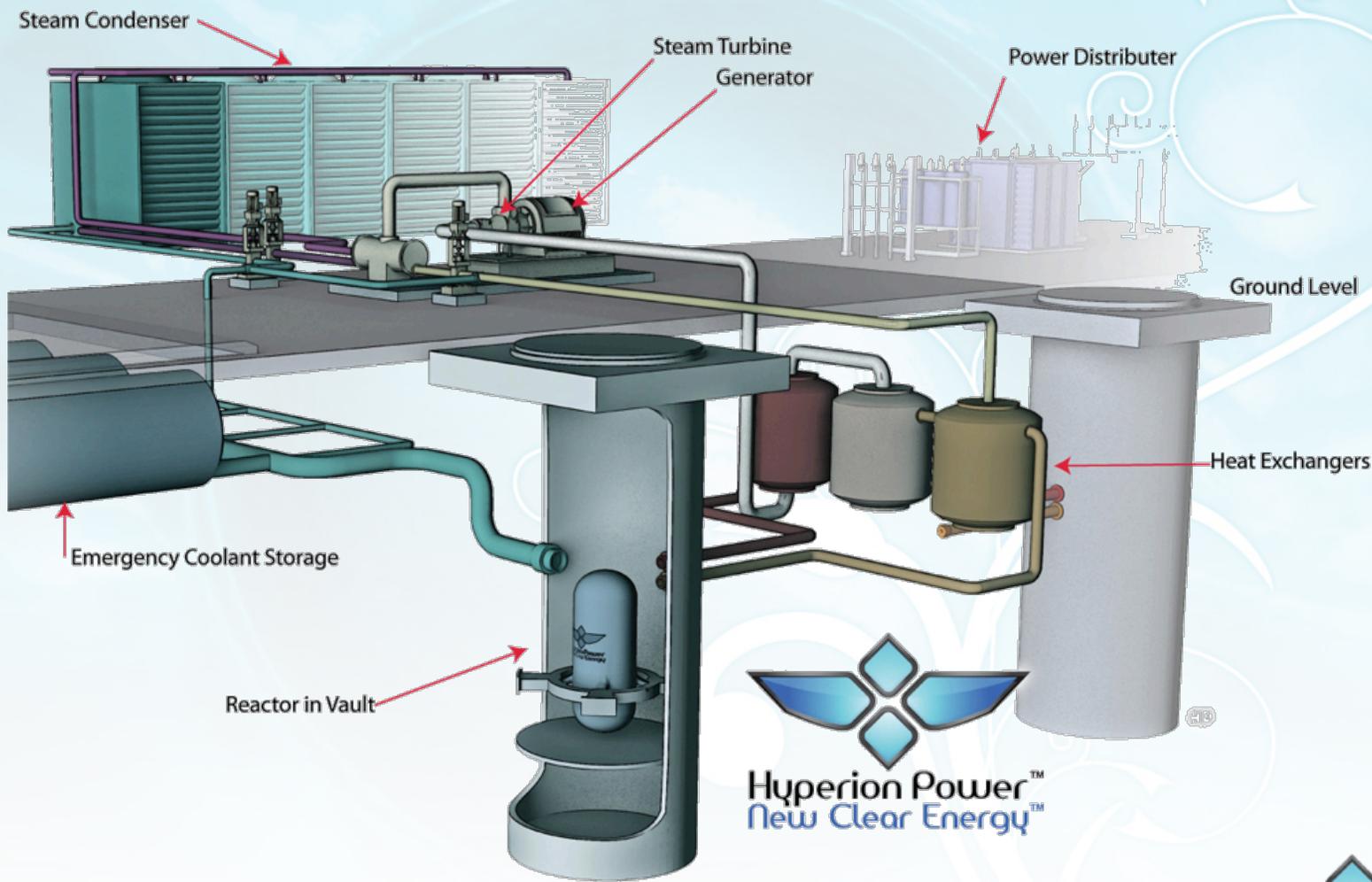
Otis (Pete) Peterson, PhD
Inventor & Chief Technical Officer

Hyperion Reactor is a “Mini”

- **Small enough to be transported**
- **Sealed core**
- **Fits standard transport cask**
- **Produces 25 MW electric**
- **Lasts 8 to 10 years**
- **Engineered by Los Alamos**
- **Safe, simple and economical**

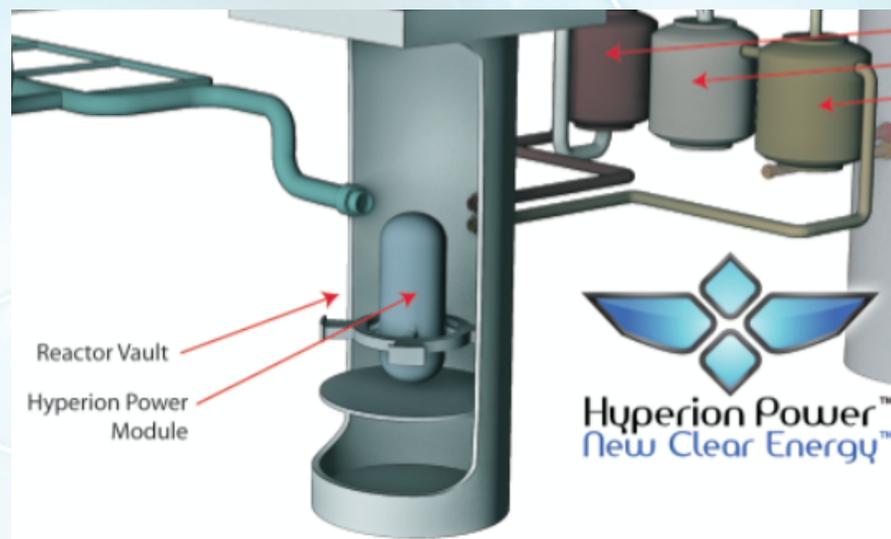


Hyperion Power Facility Layout



Hyperion Power Module

Reactor Power	70MW _{thermal}
Electrical Output	27MW _{electric}
Lifetime	8– 10 years
Size (metres)	1.5w x 2.5h
Weight (ton)	Less than 50
Structural Material	Stainless Steel
Coolant	PbBi
Fuel	Uranium nitride, ss clad elements
Enrichment (% U ₂₃₅)	<20%
Refuel on Site	No
Sealed	Yes
License	DCD / ML
Passive Shutdown	Yes
Active Shutdown	Yes
Transportable	Yes
Factory Fueled	Yes
Safety & Control Elements	Two redundant shutdown systems & reactivity control rods.



Mini Power Reactors Need Higher Enrichments

- **Enrichments near 20% permit compact reactor designs**
- **Uranium nitride (UN) fuel demonstrated stable to 6% burns**
- **Spent fuel retains 14 to 15% enrichment**

First commercial reactor to have valuable spent fuel



Reprocessing Retrieves Spent Fuel Value

- **Spent fuel retains nearly 75% of its initial value**
- **Calcining converts UN to UO₂**
- **1st stage of Purex separates fission fragments from actinides**
- **Cleaned fuel can be diluted 3:1 to yield LWR fuel**

First time that reprocessing can be economically justified



DOE contributions toward new nuclear power applications

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- **Optimize reprocessing technologies for treating higher enrichment fuels**
- **Develop facility designs and procedures for handling higher enrichment fuels**
- **Develop and optimize techniques for treating non-oxide fuels**
- **Optimize reprocessing technologies for extracting fission fragments from actinides**
- **Develop regulatory framework for above**



Contacts

Otis (Pete) Peterson, PhD
Inventor & Chief Technical Officer

Pete@HyperionPowerGeneration.com

Ph: +1 (505) 216-9130

