

Two Examples

- **Nuclear Power Reactors**
- **Eliminating Famine**

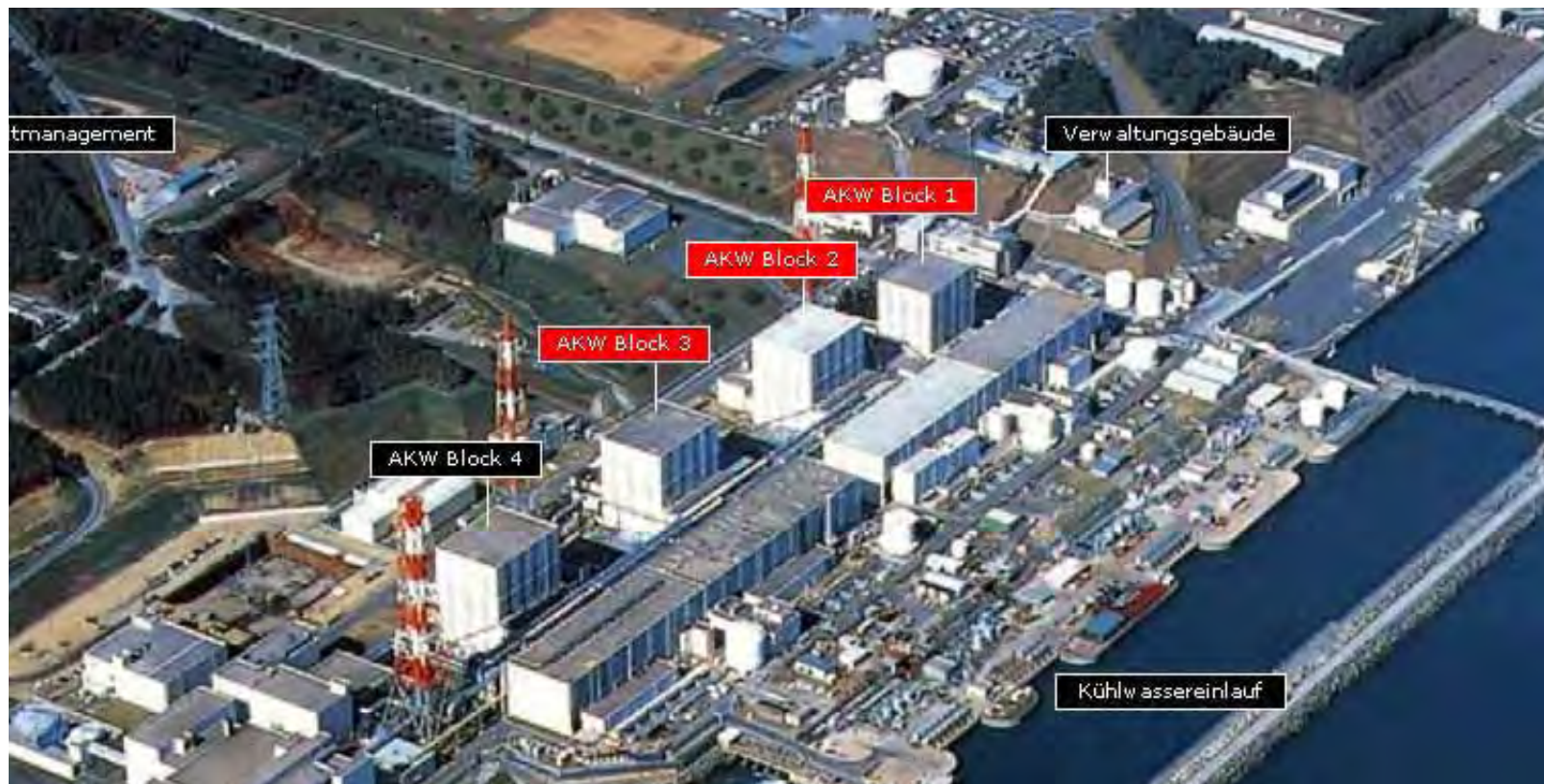
Nuclear Industries

- **Primordial fears on Radiation**
- **Distorted track record:
Safe operation ignored**
- **China Syndrome recalled**
- **Perception versus Performance**

Industrial Accidents

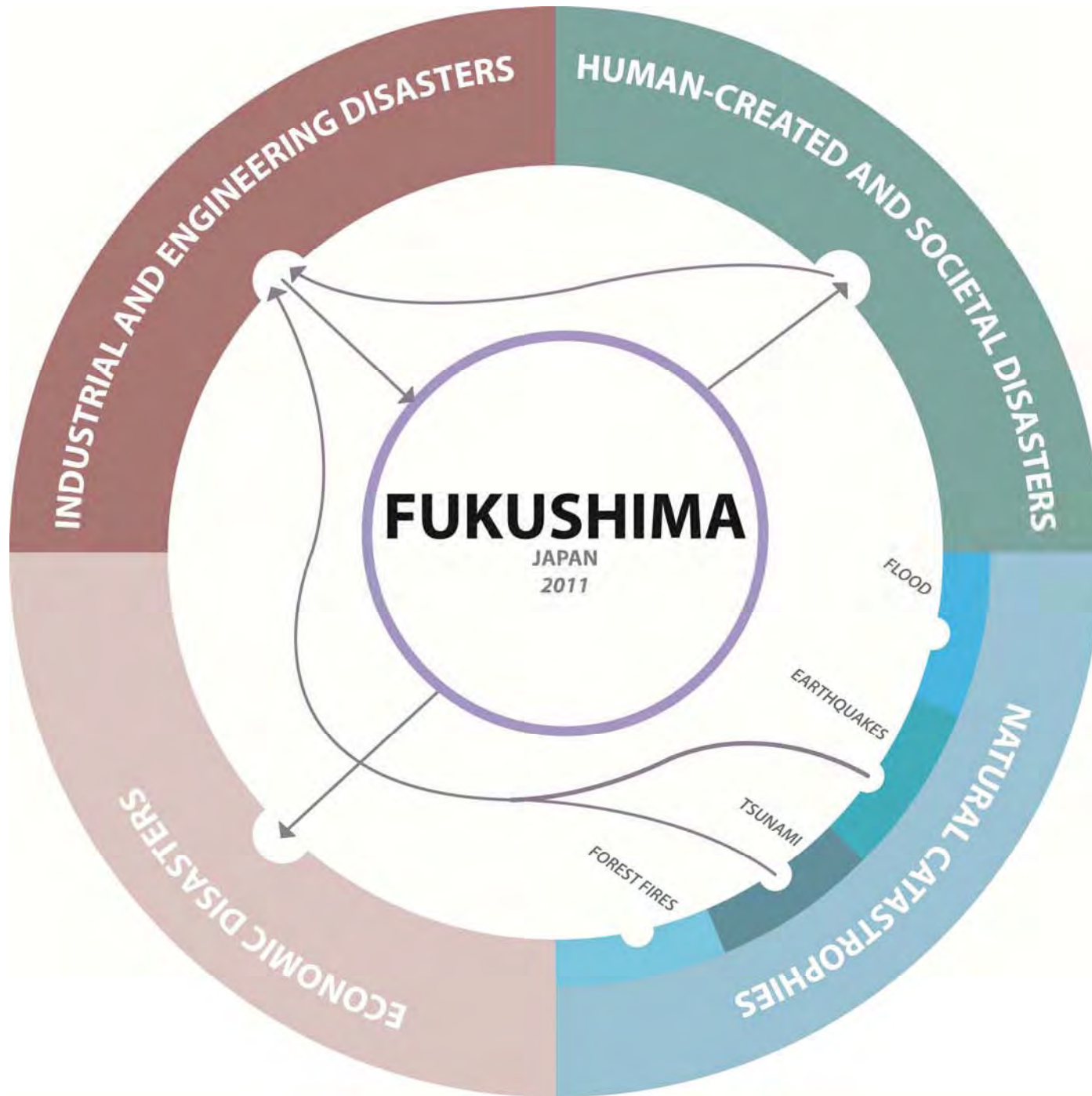
- **Complexity**
- **'Normal' Accidents**
- **Three Mile Island:**
 - **Blockage plant polisher → Tripped Two**
 - **Valves → Shutting of coldwater to steam**
 - **Generator → Back System Valve Closed**
 - **Indicator Hidden → Relief Valve**
 - **Not working → Indicator not Working → Close to core melting.**

- **Fukushima Daiichi (Plant I)**
 - Unit I - GE Mark I BWR (439 MW), Operating since 1971
 - Unit II-IV - GE Mark I BWR (760 MW), Operating since 1974



Hydrogen Explosion : Fukushima





Radiation exposures to people around Fukushima Reactors.

From measured levels of radioactive caesium deposited on the ground, exposures to about 360,000 persons now living in those areas have been estimated. (People within 20 km distance have all been evacuated)

About 335,000 of them would receive less than 40 mSv if they continue to live there for the next ten years. It could double if they are left undisturbed beyond that time period.

About 26,000 would require to be relocated to limit their exposures to the same level as the rest. About 6,000 of these would need to be relocated over the next six months to avoid higher exposures compared to the rest.

Deposits, External Doses Projected at 10 and 70 Years and affected Populations

Deposits of caesium (¹³⁷ + ¹³⁴) (Source MEXT)	> 300,000 Bq/m ²	> 600,000 Bq/m ²	> 1 million Bq/m ²	> 3 millions Bq/m ²	> 10 millions Bq/m ²
External dose at 10 years (70 mSv by MBq/m ²)	> 19 mSv	> 38 mSv	> 63 mSv	> 190 mSv	380 - 1,900 mSv
External lifetime dose (70 years) (160 mSv par MBq/m ²)	> 41 mSv	> 82 mSv	> 136 mSv	> 408 mSv	816 - 4,080 mSv
Affected population (excluded the no-entry zone)	292,000	69,400			
		43,000	26,400		
			21,100	3,100	2,200

From,
 ASSESSMENT ON THE 66TH DAY OF PROJECTED EXTERNAL DOSES FOR POPULATIONS LIVING IN THE NORTH-WEST FALLOUT ZONE OF THE FUKUSHIMA NUCLEAR ACCIDENT- OUTCOME OF POPULATION EVACUATION MEASURES -Report DRPH/2011-10
 DIRECTORATE OF RADIOLOGICAL PROTECTION AND HUMAN HEALTH
 Institut de Radioprotection et de Surete Nucleaire, France
 NB - MEXT is Ministry of Education, Culture, Sports, Science and Technology of Japan.
 MBq refers to radioactivity deposited on the ground (MegaBecquerels; 37 MBq is 1 milliCurie)

