How safe is enough safe?

Joint IAEA-ICTP Essential Knowladge Workshop on Nuclear Power Plant Design Safety – Updated IAEA Safety Standards 9-20 October 2017

Presented by
Ivica Basic
APoSS d.o.o.

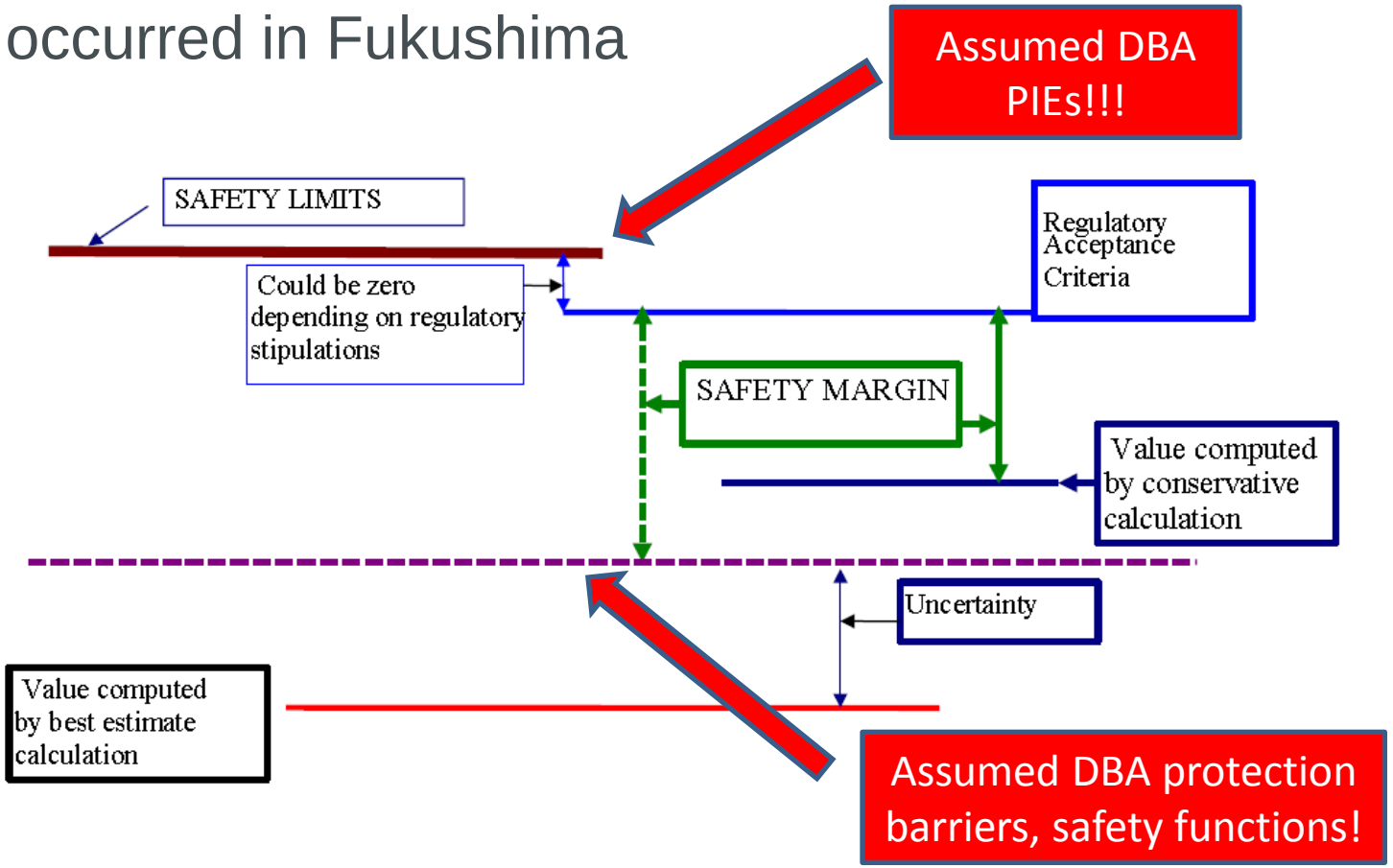
IMPORTANT DECISIONS

HOW SAFE IS ENOUGH SAFE

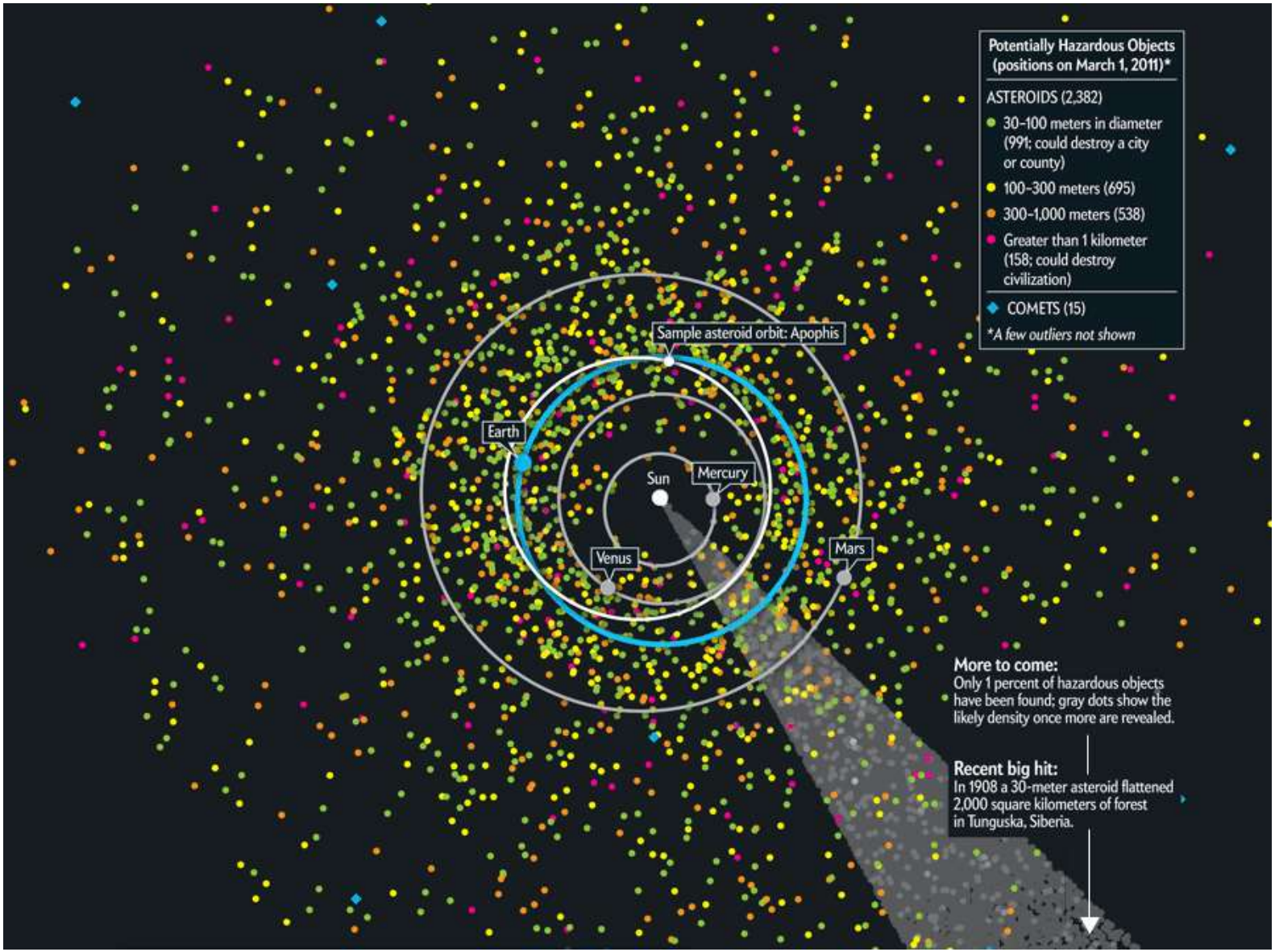
Overview: WENRA Stress Tests Proposal

Why re-evaluation of the Design (Safety) Margins?

- **"Stress test"** as a targeted **reassessment of the safety margins** of NPPs in the light of the events which occurred in Fukushima



General Safety



General Safety

Example:

American Scientific (http://www.scientificamerican.com/article.cfm?id=death-by-asteroid) referenced NASA study about dangerous asteroids close to the Earth:

- 2382 asteroids with diameter > 30m which can destroy the whole big city (evidence for such event happen in the newer history: 1908 in Siberia when 2000km2 was destroyed what is 5% of the whole surface of Republic of Croatia, 56.542 km2)

Simple calculation of probability:

1/100 (impact per year, even that we do not evidence how much of them drop in the oceans which occupies 2/3 of Earths surface) * 56.542 km2 / 510.065.284 km2 (surface of Earth) = **1.1*10-6 /god (or once per million years)**.

Questions:

1. **What can be statistical acceptable criteria for observed catastrophic natural disaster from history?**
2. **What is with other dangerous industry (e.g. chemistry, military, …)?**

THE OVERALL GOALS OF THE SAFETY ASSESSMENT CAN BE FORMULATED AS FOLLOWS:

To demonstrate that the plant is as safe as originally intended;

To evaluate the actual plant status with respect to:

- ageing and wear-out identifying any structures, systems or components that could limit the life of the plant in the foreseeable future,
- and to identify appropriate corrective actions, where needed;

To compare current level of safety:

- in the light of modern standards and knowledge (related to the initiating events and statistical treatement of them) and
- to identify where improvements would be beneficial for minimising. deviations at justifiable costs.