IAEA 60 Years
Atoms for Peace and Development

International Conference on Probabilistic Safety Assessment and Management (PSAM 14)
UCLA Meyer & Renee Conference Centre, Los Angeles, CA, September 16-21, 2018

Risk Communication

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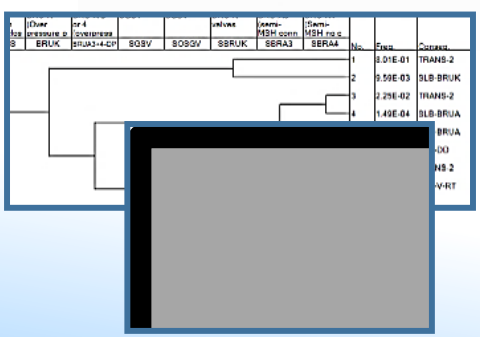
What is risk communication ?

- External and internal risk communication
- **External Risk communication** is an interactive process used in talking or writing about topics that cause concern about health, safety, security, or the environment *(NUREG/BR-0308)*
- **Internal risk communication** is communication between risk analysts and senior-level decision and policy makers, typically in support of decision-making process

Internal risk communication

- Let's determine three phases / aspects

Risk models



Communication of risk insights

Decision making

1. Risk models

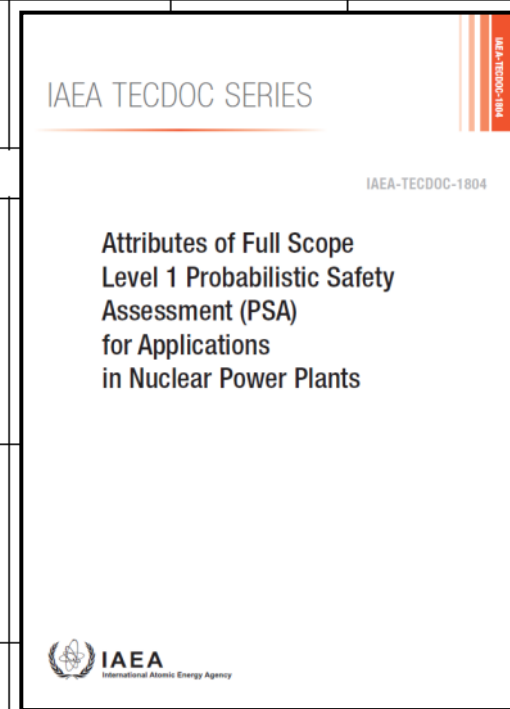
- Risk models need to capable provide all the aspects that need to be communicated
- Risk models need to consider the indented use, potential decisions to be made
- Example: Use of risk insights to support RI AOT
- Example: Use of risk insights to support improvement of operating procedures (HRA, AS)

1. Risk models

IAEA TECDOC-1804 "Attributes of full scope L1 PSA for Applications in NPPs"

Mapping the special attributes of PSA elements to PSA applications

PSA Application Group/ PSA Application	PSA Elements								
	IE	AS	SC	SY	HR	DA	DF	MQ	Other
3.1.3 Risk informed support for plant ageing management programme	IE-H02-S1	-	-	SY-B19-S1 SY-B22-S1	-	DA-E01-S1	DF-F01-S1 DF-G01-S1	-	-
3.1.4 Risk informed on-line maintenance	-	-	-	-	-	-	-	MQ-A01-S1 MQ-C02-S1	-
3.1.5 Plant outage management	-	-	SC-A03-S1	-	HR-G02-S1 HR-G04-S1 HR-K02-S1 HR-K05-S1	-			
3.2 Accident mitigation and emergency planning									
3.2.1 Development and improvement of the emergency operating procedures	-	AS-B03-S1 AS-C03-S1 AS-C04-S1 AS-C16-S1 AS-C05-S1 AS-C06-S1 AS-C08-S1	-	-	HR-G02-S1 HR-G04-S1	-			
3.2.2 Support for NPP accident management (severe accident prevention, severe accident mitigation)	IE-B01-S1	-	-	-	HR-G02-S1	DA-D06-S1			
3.2.3 Support for NPP emergency planning	IE-B01-S1	AS-C05-S1	-	-	-	-			



2. Communication of risk insights

- What needs to be communicated?
- IAEA SSG-3: L1PSA results should include
  - CDF, IE contributions, MCSs, sensitivity, uncertainty, importance measures
- Both positive & negative implications
- Aggregated AND disaggregated results
- Quantitative and qualitative information

Mid-Level Decision Makers

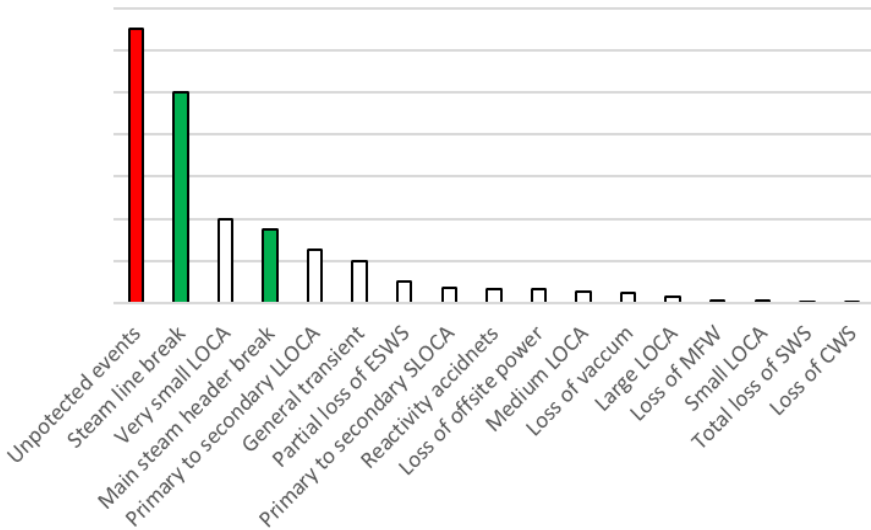
- Public: e.g. the train industry presents

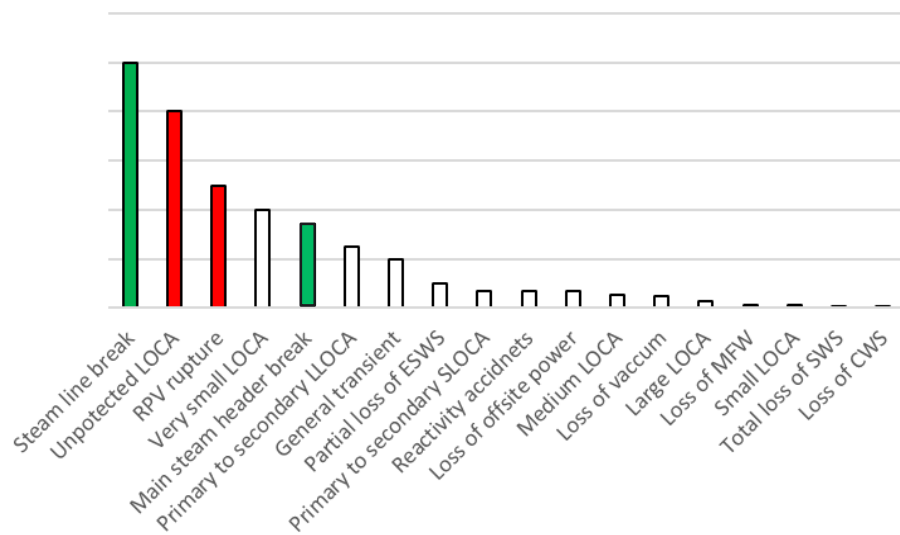
$$R = N_{fatalities} / N_{passgr./km.travel}$$

2. Communication of risk insights

Lessons learned (examples)

- Clear representation of risk profile





- More insights – less unnecessary details

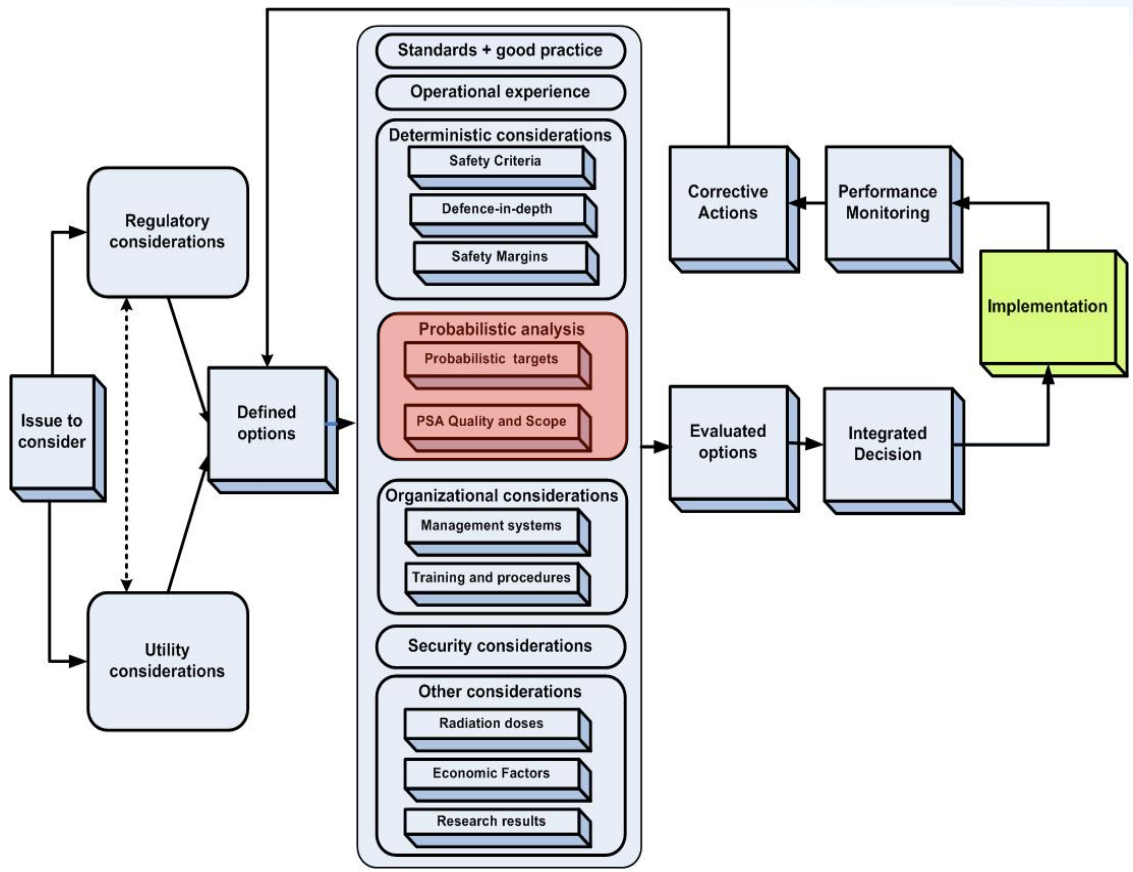
CCF concept **vs**

$$Q_k = \frac{1}{\binom{m-1}{k-2}} \left(\prod_{i=1}^{k} \rho_i \right) (1 - \rho_{k+1}) Q_t$$

$$\rho_1 = 1, \rho_2 = \beta, \rho_3 = \gamma, \ldots, \rho_{m+1} = 0$$

3. Decision making

- What happens afterwards?
- Integrated RIDM (IRIDM) is a systematic decision-making process that takes account of all relevant safety aspects in making a safety decision



** Main principles are presented in INSAG-25 report, relevant TECDOC is in publication process*

3. Decision making

Challenges in decision making process

- Uncertainties
  - Check the input, in terms of uncertainty parameters
- "Weighting" of the inputs used as a basis for decision making (e.g. in IRIDM framework)
- Understanding of risk models (by mid-level DMs)
  - PSA and RIDM training for managers is important

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Thank you!