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A common approach for assessing the safety of natural gas compressor stations

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On behalf of the WGCS

Presentation contents

- Introduction to the WGCS & SARONG
- The WGCS methodology
- The prototype software SARONG
- Applicability and issues



Introduction to the WGCS & SARONG

WGCS
(1997)

Working Group on Compressor Safety



Technical co-operation pertaining to the safety of compressor stations



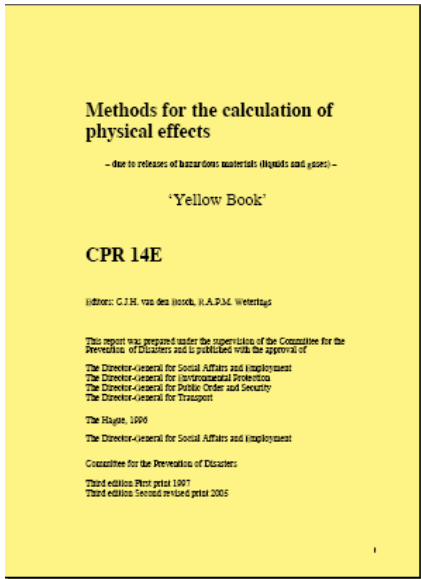
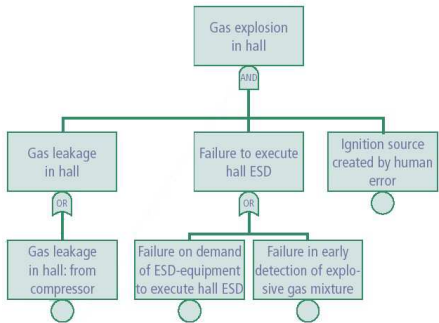
SARONG
(2003)

Software for the Assessment of Risk On Natural Gas stations

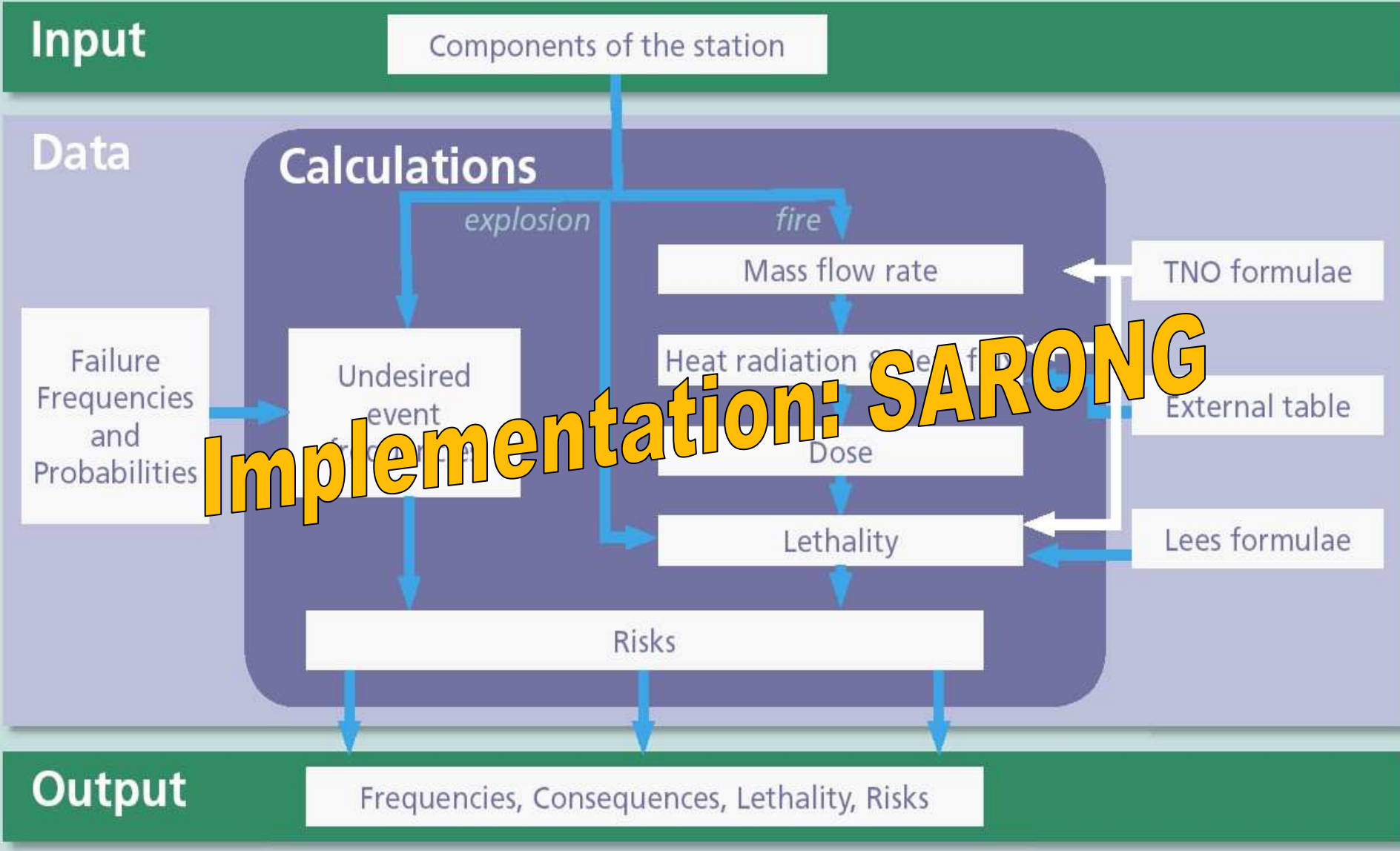


The WGCS methodology (1/2)

- Description of the station
- Definition of the risk scenario's
- Application of fault tree analysis theory
- Determination of the failure frequencies
- Calculation of the consequences
- Expression of the risk



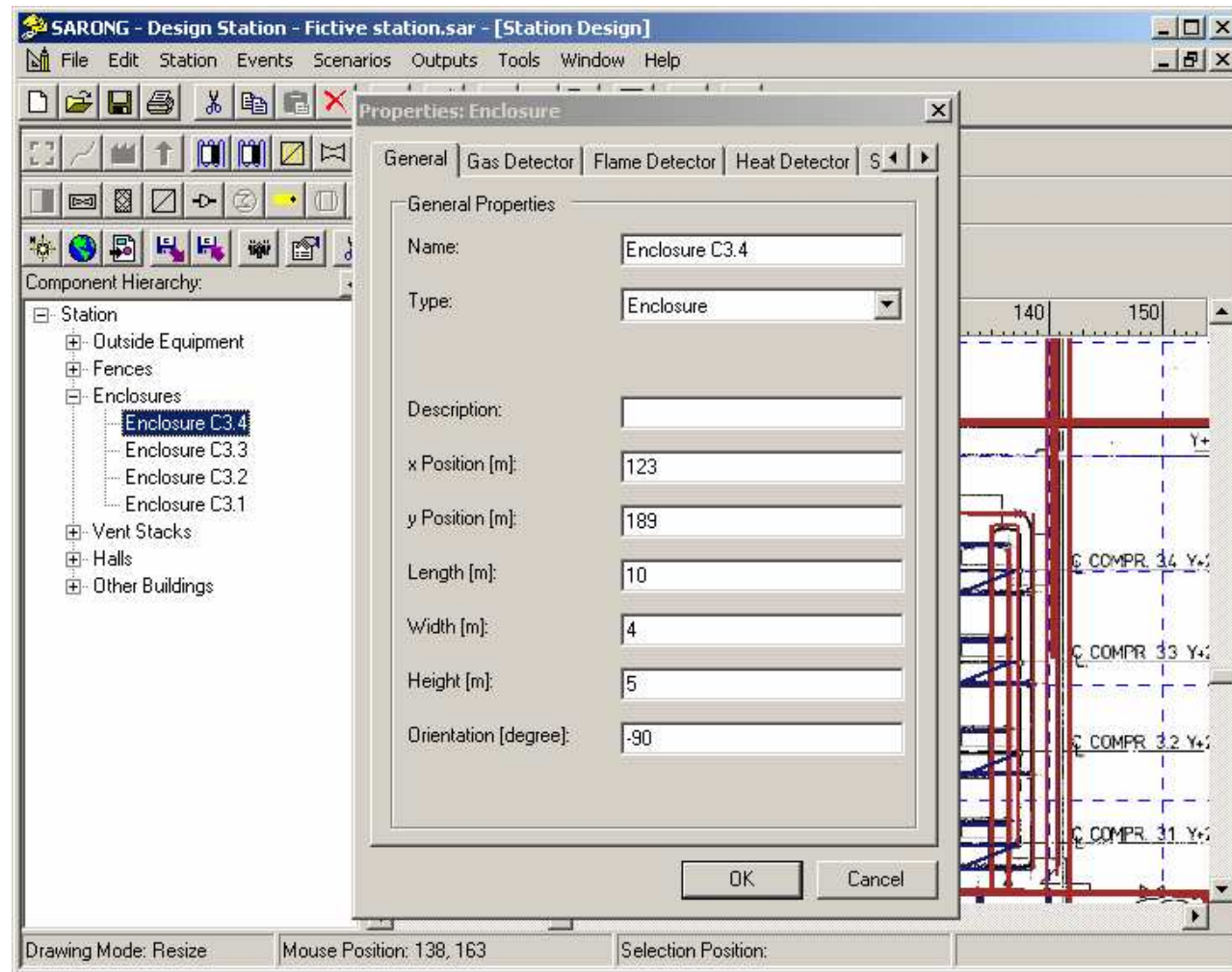
The WGCS methodology (2/2)



Implementation: SARONG

The prototype software SARONG (1/3)

SARONG: Easy and user-friendly



The prototype software SARONG (2/3)

SARONG: A powerful information management tool

The screenshot displays the SARONG software interface for a fictive station, showing failure frequencies across different levels of detail. The interface includes a menu bar (File, Edit, Station, Events, Scenarios, Outputs, Tools, Window, Help) and a toolbar with various icons.

Top Event Failure Frequency

Top Event	Parent Component	Failure Frequency [/a]
TE05: Fire in Hall	Hall 2	0
TE05: Fire in Hall	Reducer hall	0
TE06: Fire outside Hall	Outside Equipment	0.004299

Summed Sub Tree Failure Frequency: TE06, Outside Equipment

Sub Tree	Failure Frequency [/a]
ST0601: Small leakage from components or pipes	0.004237
ST0602: Large leakage from components or pipes	5.117E-05
ST0603: Rupture from a pipe	2.648E-07
ST0604: Error measure	1E-05

Sub Tree Failure Frequency: ST0601, Outside Equipment

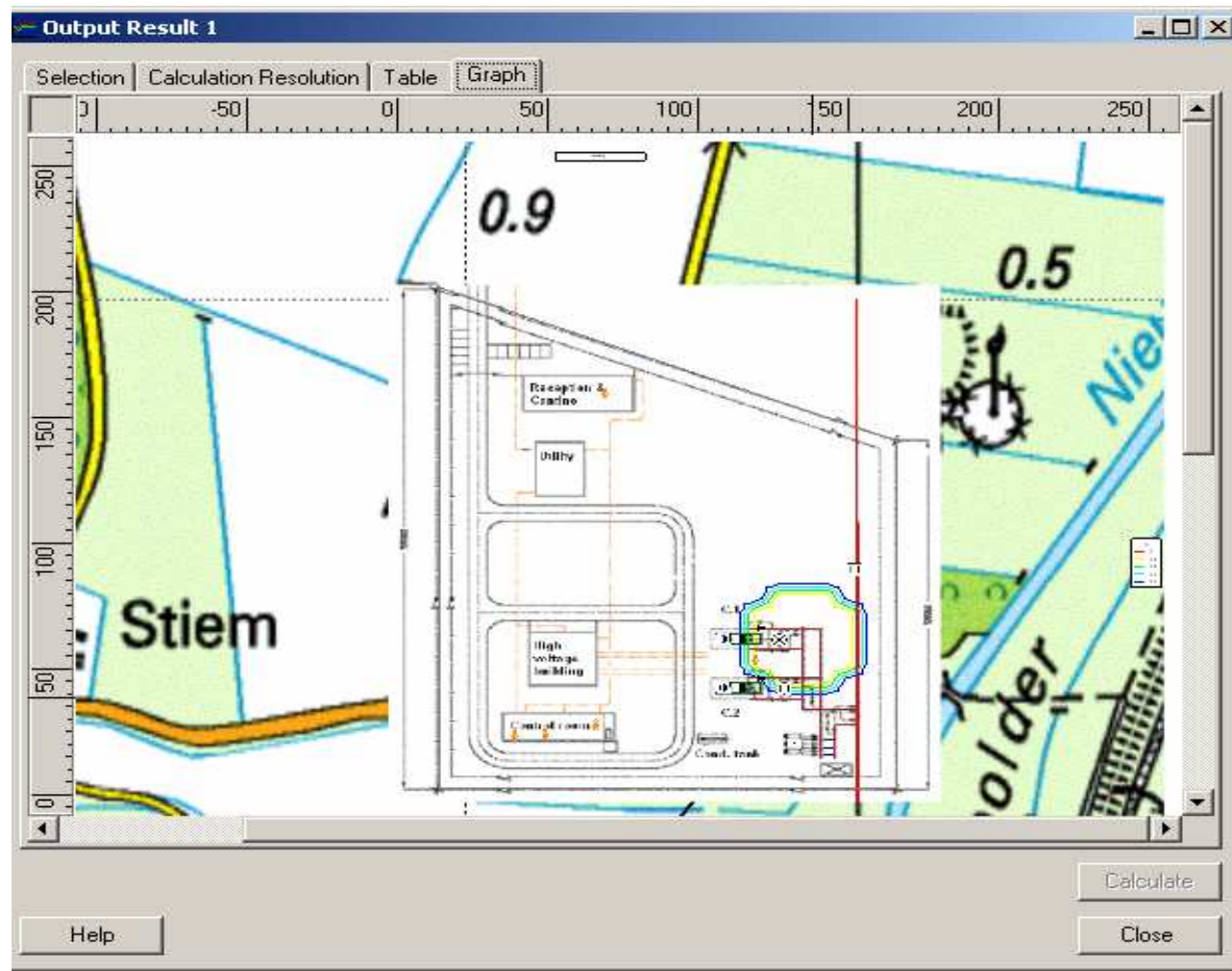
Component	Failure Freq. (calc.) [/a]	Failure Freq. (set) [/a]
PipeLine: Pipe segment 0	2.874E-10	
Scrub 2: Pipe segment 0	4.139E-10	
Scrub 1: Pipe segment 0	4.139E-10	
Elkafiak 42" (2): Pipe segment 0	2.214E-10	

Basic Event Values: ST0601, Outside Equipment, PipeLine: Pipe segment 0

Basic Event	Failure Frequency [/a]	Failure Probability	Initial Mass Flow Rate (kg/s)
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The prototype software SARONG (3/3)

SARONG: A clear overview of the results



Applicability and issues

The methodology and SARONG could be used for:

- Compressor and other natural gas stations
- Producing quantitative safety assessment
- Optimizing safety
- Ranking stations safety levels
- Investigating different designs

Conclusion

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- Fruitful collaboration
- New ideas and projects
- Open for collaboration

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Thank you!