

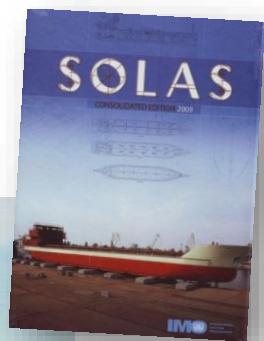


LASH FIRE

Legislative Assessment for Safety Hazards of Fire and Innovations in Ro-ro ship Environment

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6 Mars 2019



RISE Research Institutes of Sweden

SAFETY AND TRANSPORT
Fire Research

Four are now one: RISE Research Institutes of ~~Sweden~~

- Instituten SP, Innventia, Swedish ICT och Swerea har gått samman i RISE för att bli en starkare forsknings- och innovationspartner



Facts about RISE

- 2 700 medarbetare, 30% disputerade forskare
- Omsättning ca 2,7 miljarder SEK
- Små och medelstora företag står för ca 30%
- Driver ett 100-tal test- och demonstrations-miljöer, öppna för företag och lärosäten (Ägare och partner i 60 % av Sveriges samlade test- och demonstrationmiljöer)

RI. SE

With our broad range of competencies and unique expertise, we create added value



Bioeconomy



Fire Research



Cement, ballast and concrete



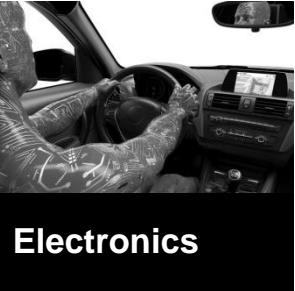
Certification



Circular economy



Design



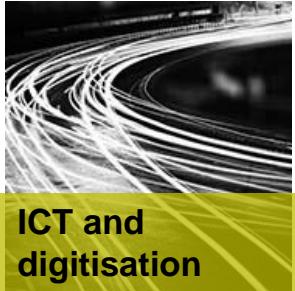
Electronics



Energy and fuels



Glass



ICT and digitisation



Agriculture



Chemistry, materials and surfaces



Health and Life Science



Food



Mechanical engineering



Pulp and paper



Mechanics



Metrology



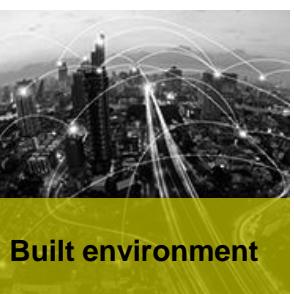
Mobility



Perception



Process development



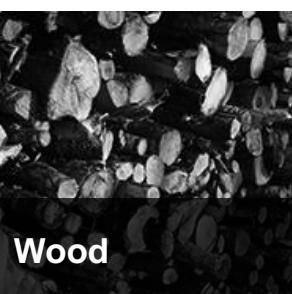
Built environment



Systems analysis, service design



Applied measurement technology

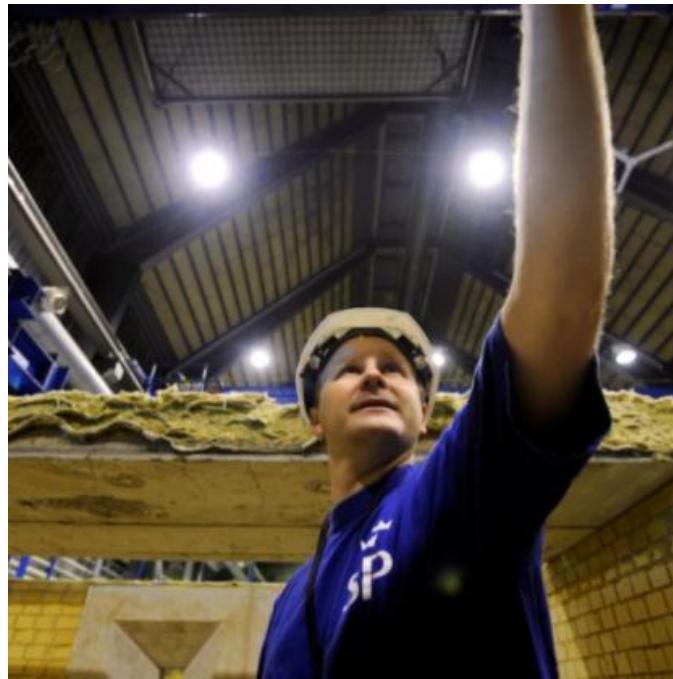


Wood

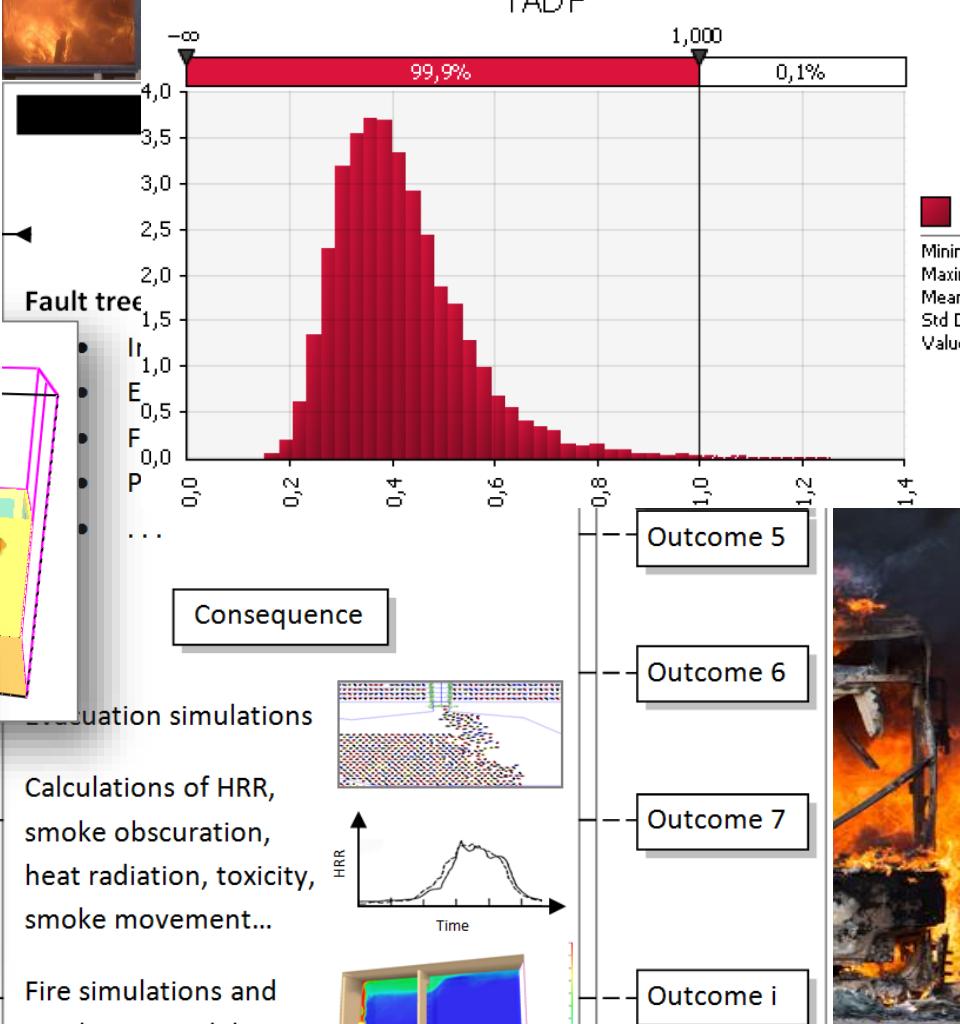
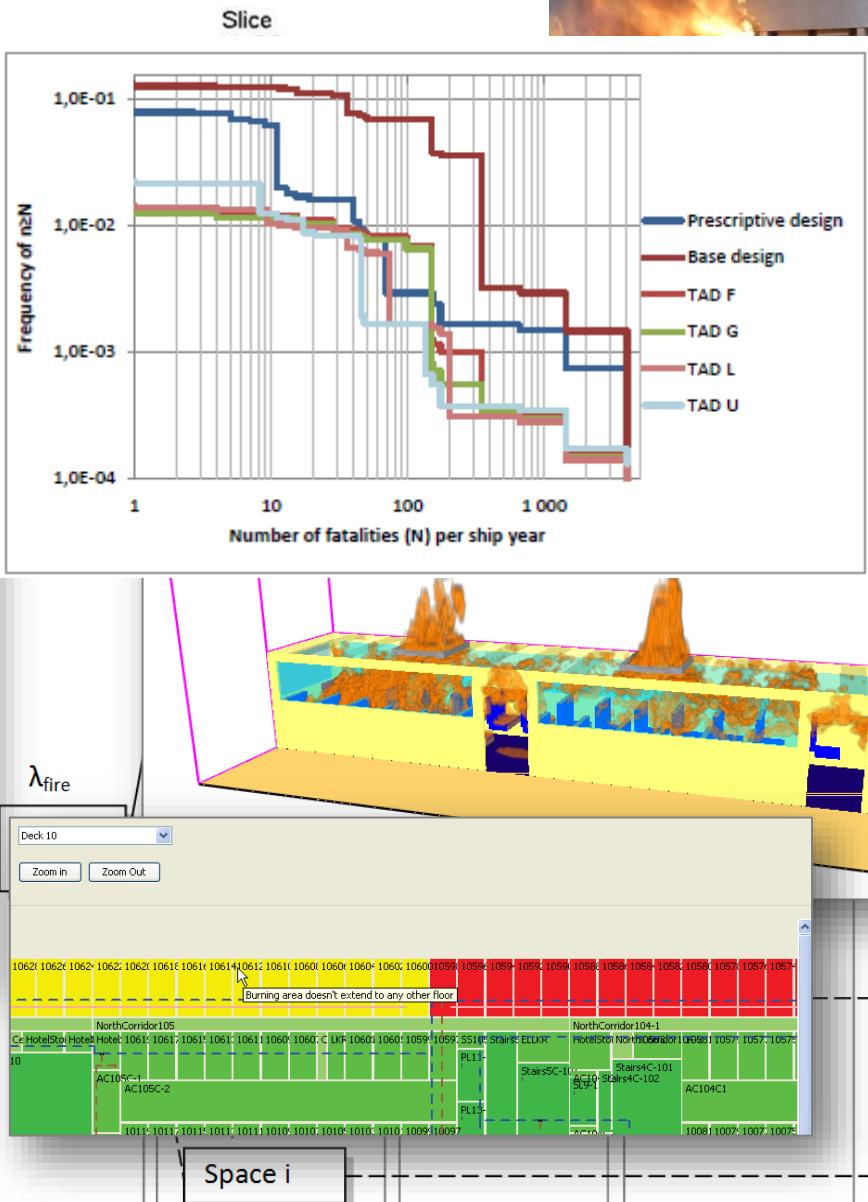
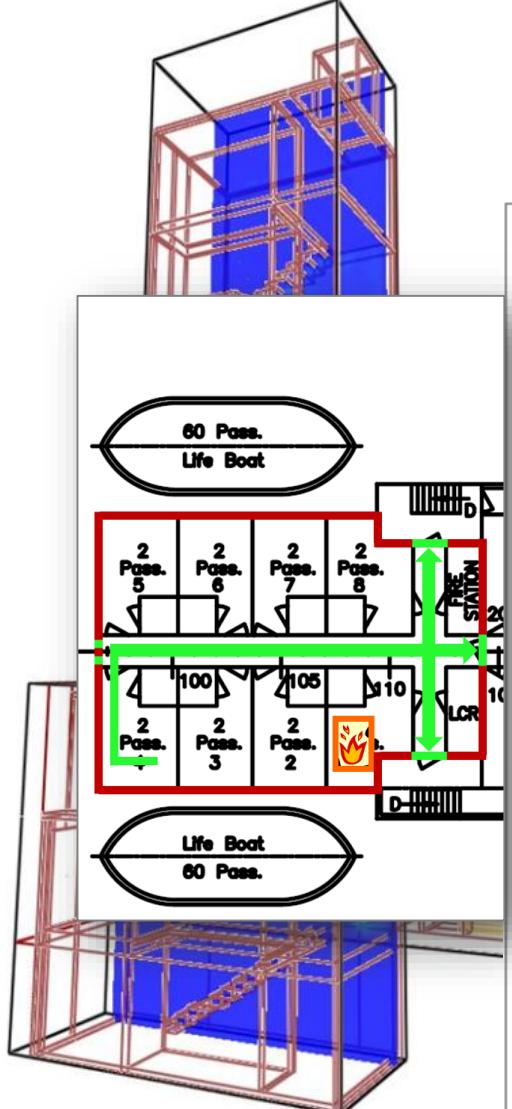


Water

RISE Fire Research



RISE Fire Research

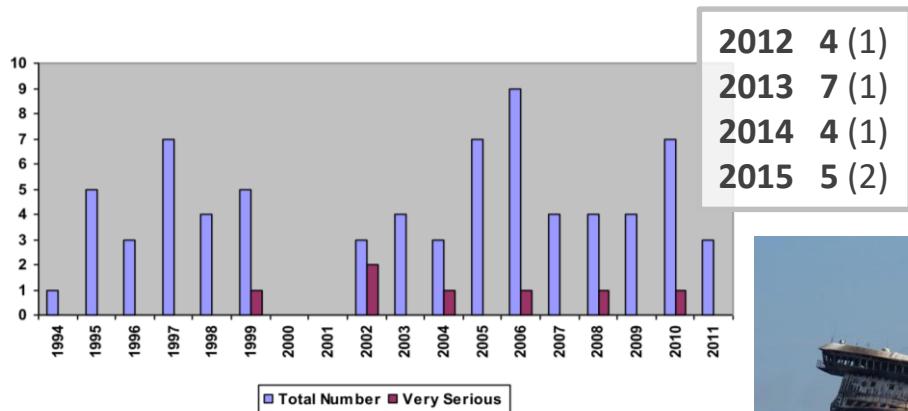


Background - History

FSI 21/5 (2012): "There have been a number of significant fire incidents on ro-ro passenger vehicle decks since 1994 and there is no sign of these diminishing."

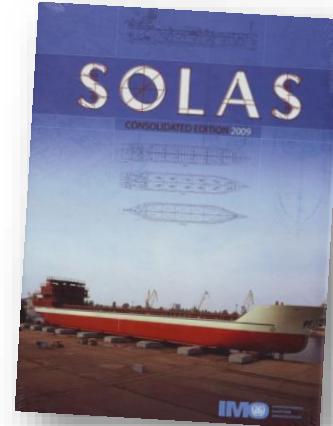


MSC 97 (2016): Fire safety of ro-ro passenger ships



Background - Projects

- Development of test standard for extinguishing systems on ro-ro deck
- Model Scale Fire Tests on a Vehicle Deck on Board a Ship
- Commercial ro-ro/pax fire safety projects
- FIRESAFE (2016)
 - Electrically induced fires
 - Failure of drencher system
- FIRESAFE II (2017-2018)
 - Detection
 - Decision (Human factors)
 - Evacuation
 - Containment
 - Alternative detection and extinguishing systems
- SEBRA (2018)
 - Improved fire protection through good examples
- RO5 (2018-2019)
 - Ro-ro Space Fire Ventilation
- BREND (2018-2019)
 - Firefighting of Alternative Fuel Vehicles on Deck

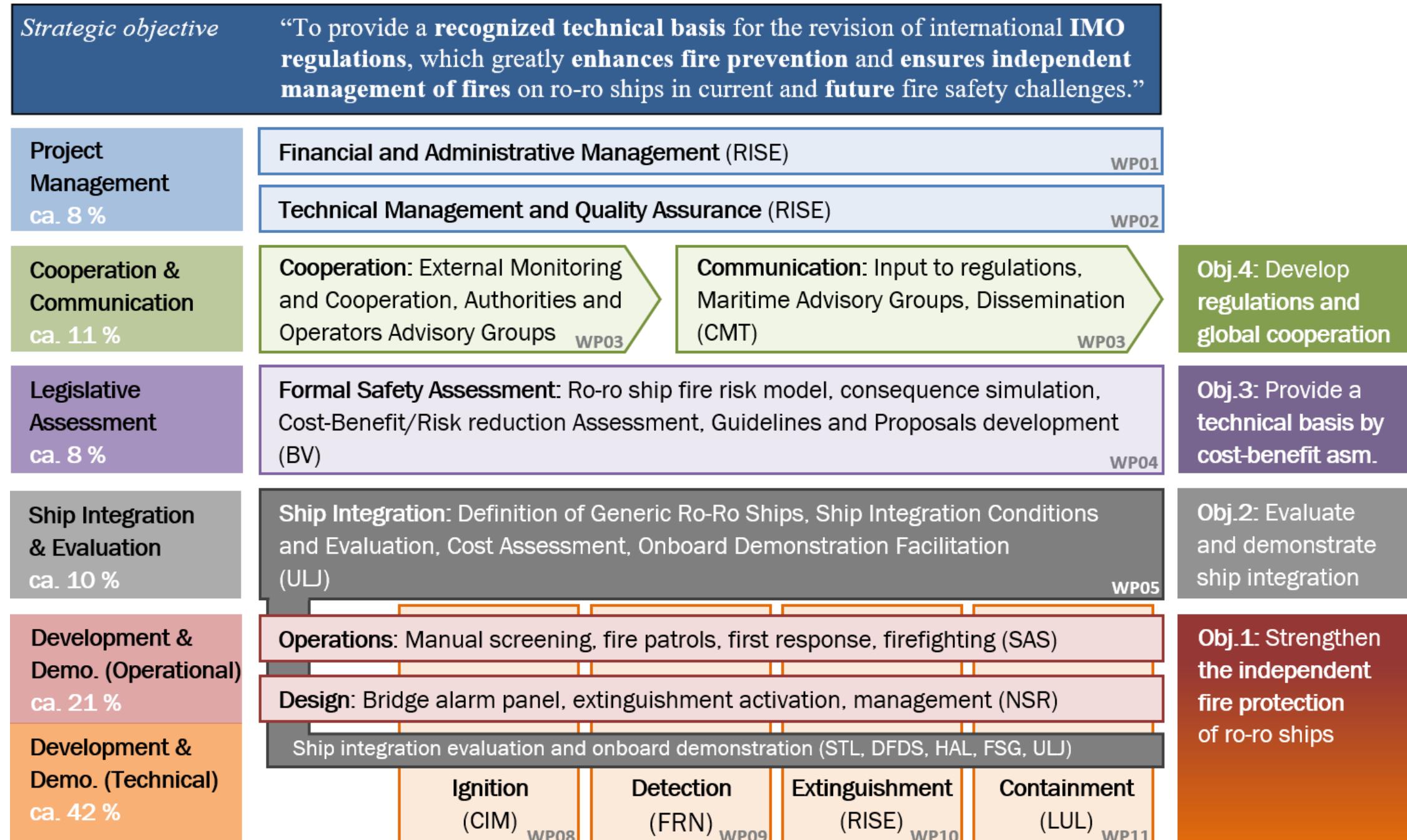


System suppliers (fire division, detection, electrical, extinguishment, drone...)									
	UAC		MAR		SCK		APS		
	F4M		FEK		UNF				
Research & Development suppliers (institutes, universities, training centre)									
	RISE		VTT		UCY		NSR		SAS
	LUL		FRN		CIM		RS2N		NTNU
Ship integration (ship owners and shipyards)									
	STL		DFDS		HAL		FLOW		DSGO
Regulatory bodies & External relations (Classification society, trade associations...)									
	CMT		INF		MAG		SEA		BV
Authorities Advisory Group (Flag States with confirmed interest – goal: >10 members)									
	BEL		DNK		SWE		GER		USA
	GBR		FIN		NOR				



RISE	RISE RESEARCH INSTITUTES OF SWEDEN AB	SWE	Forsknings- och provningsinstitut
VTT	TEKNOLOGIAN TUTKIMUSKESKUS VTT Oy	FIN	Forsknings- och provningsinstitut
FRN	RISE FIRE RESEARCH AS	NOR	Forsknings- och provningsinstitut
FLOW	FLOW SHIP DESIGN DOO ZA PROJEKTIRANJE, KONZALTING I INZENJERING U BRODOGRADNJI	HRV	Fartygskonstruktörer
MAR	MARIOFF CORPORATION Oy	FIN	Vattendimssystem
DSGO	SCHEEPSWERF DAMEN GORINCHEM BV	NLD	Varv
CMT	CENTER OF MARITIME TECHNOLOGIES EV	DEU	Org för redare m.fl.
BV	BUREAU VERITAS MARINE & OFFSHORE REGISTRE INTERNATIONAL DE CLASSIFICATION DE NAVIRES ET DE PLATEFORMES OFFSHORE	FRA	Klassningssällskap
APS	AP SENSING GmbH	DEU	Sensorer
STL	STENA REDERI AB	SWE	Redare
INF	EUROPEAN FERRY COMPANY (Interferry?)	BEL	Redarförening
SEA	SHIPYARDS AND MARITIME EQUIPMENT ASSOCIATION OF EUROPE	BEL	Organisation för varvsindustrier
SCK	SICK AG	DEU	Sensorer
NTNU	NORGES TEKNISK-NATURVITENSKAPELIGE UNIVERSITET NTNU	NOR	Universitet
SAS	SOCIEDAD de SALVAMENTO y SEGURIDAD MARITIMA	ESP	Övningscenter marint
CIM	CENTRE INTERNACIONAL DE METODES NUMERICS EN ENGINYERIA	ESP	Forskningsinstitut
MAG	MAGELLAN-ASSOCIACAO PARA A REPRESENTACAO DOS INTERESES PORTUGUESES NO EXTERIOR	PRT	Konsult EU-projekt marin koppling
LUL	UNIVERSITE DE LORRAINE	FRA	Universitet
NSR	NTNU SAMFUNNSFORSKNING AS	NOR	Forskningsinstitut
FKE	FIKE SAFETY TECHNOLOGY Ltd	GBR	Detektion
RS2N	SARL RS2N	FRA	beräkningsverktyg
UAC	UNIACCESS	FRA	brandskyddsvävar
UCY	UNIVERSITY OF CYPRUS	CYP	Universitet,
DFDS	DFDS AS	DNK	Redare och hamn logistik
F4M	FIFI4MARINE BV	NLD	CAFS
HAL	HÖEGH AUTOLINERS AS	NOR	Redare o logistik
UNF	UNIFIRE AB	SWE	Vattenkanon + sensor

Project objectives and structure



Project objectives and structure

Objective 3

LASH FIRE will **propose new regulations and guidelines** founded on **common positions** by drawing upon **global experience and research** and by facilitating **international cooperation**.

Integration &
Communication
ca. 13 %

Integration: External Review and
Cooperation, Advisory Groups
(CMT)

WP03

Communication: Advisory Groups, Input
to regulations, Dissemination,
(CMT)

WP03

Obj.3: Develop
regulations and
global cooperation



Verifiable target and action goals:

- | | | |
|-------|---|---|
| WP03 | Integration & Communication: | Provide global experience integration and research communication. |
| (3-1) | External review and cooperation: | Facilitate global research integration and cooperation. |
| (3-2) | Maritime Advisory Groups: | Establish an Authorities Advisory Group primarily consisting of more than 10 Flag States and an Operators Advisory Group with more than 6 ro-ro ship operators. |
| (3-3) | IMO proposal administration: | Provide for input to the IMO and review and administrate IMO activities. |
| (3-4) | Dissemination: | Disseminate project results to maritime industry and academia. |

Project objectives and structure

Objective 2 LASH FIRE will provide a **technical basis** for future revisions of regulations by **assessing risk reduction and economic properties** of solutions.

Legislative
Assessment
ca. 10%

Formal Safety Assessment: Risk model development, Cost benefit assessment, Proposal development (BV)

WP04

Obj.2: Provide a
technical basis by
cost-benefit asm.

Verifiable target and action goals:

- WP04 **Formal Safety Assessment:** Provide a technical basis for legislative assessment by evaluation in line with Formal Safety Assessment procedures of at least 15 regulatory proposals, based on technical solutions developed in the project.
- (4-1) Holistic RA model: Develop a holistic ro-ro ship fire risk assessment model for fires originating on ro-ro deck.
- (4-2) Formal Safety Assessment Evaluate at least 15 regulatory proposals, based on developed technical solutions, in line with FSA procedures.
- (4-3) Recom. for Decision-making Prepare guidelines and proposals for rule-making, based on current regulations and the technical basis provided by the project.

Actions in Development and Demonstration WPs

WP06 Effective Manual Operations		Cur	Fut	Reg.i	TRL	Validation
(6-A)	Manual screening of cargo fire hazards and effective fire patrols	C	F	R	6-7	Onboard/Terminal
(6-B)	Quick manual fire confirmation and localization	C	F		6-7	Onboard
(6-C)	Efficient first response	C			6	Onboard
(6-D)	Effective and efficient manual firefighting	C	F		6	Onboard/Field
WP07 Inherently Safe Design		Cur	Fut	Reg.i	TRL	Validation
(7-A)	Improved fire detection system interface design	C		R	5-6	Onboard/Virtual
(7-B)	Efficient extinguishing system activation and inherently safe design	C		R	6	Onboard
(7-C)	Firefighting resource management centre	C	F		6	Onboard/Virtual
WP08 Ignition Prevention		Cur	Fut	Reg.i	TRL	Validation
(8-A)	Automatic screening and management of cargo fire hazards	C	F		5	Onboard/Shore
(8-B)	Guidelines and solutions for safe electrical connections	C	F	R	6-7	Onboard
(8-C)	Fire requirements for new ro-ro space materials	C	F	R	6-7	Lab
WP09 Detection		Cur	Fut	Reg.i	TRL	Validation
(9-A)	Detection on weather deck	C		R	6-7	Onboard
(9-B)	Detection in closed and open ro-ro spaces	C		R	7	Onboard
(9-C)	Technologies for visual fire confirmation and localization	C			6-7	Onboard
WP10 Extinguishment		Cur	Fut	Reg.i	TRL	Validation
(10-A)	Local application fire-extinguishing systems	C	F		5	Lab
(10-B)	Weather deck fixed fire-extinguishing systems	C		R	6	Onboard
(10-C)	Updated performance of alternative fixed fire-fighting systems	C		R	6	Lab
WP11 Containment		Cur	Fut	Reg.i	TRL	Validation
(11-A)	Division of ro-ro spaces	C			5	Lab/Onboard
(11-B)	Ensuring safe evacuation	C		R	6	Virtual/Shipyard
(11-C)	Safe design with ro-ro space openings	C		R	6	Virtual/Lab
(11-D)	Ro-ro space ventilation and smoke extraction	C		R	5-6	Lab/Onboard



THANK YOU FOR YOUR ATTENTION!

RISE Research Institutes of Sweden

SAFETY AND TRANSPORT
Fire Research

