



RELCON SCANDPOWER
Risk Management



How safe is safe enough?

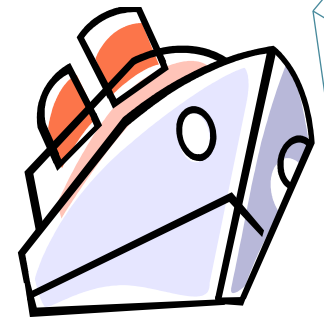
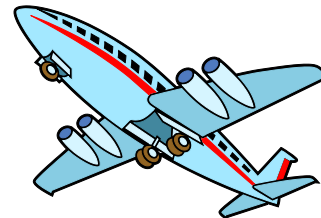
Safety crew onboard passenger trains

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Aim of the study

- **To perform a study of the rules, regulations and best practice regarding manning of passenger trains**
 - In Sweden, Norway, Denmark and Germany
 - Selected operators
 - Only manning with tasks related to evacuation and passenger safety
- **To identify principles for manning in other types of transportation (i.e. aviation and shipping)**
- **Compare, and learn from them!**



Collecting of information

- **Existing rules, regulations and internal requirements regarding**
 - Train operation
 - Rolling stock
 - Manning in general
 - Education of personnel (drills, continuous education)
 - Passengers and their luggage

were identified with respect to evacuation and passenger safety

Interviewed train operators: DSB, NSB, SJ, Flytoget, A-Train and DB



Safety Crew - Definition

” Onboard personnel with special education within passenger safety, and with responsibility to assist in a situation when evacuation of passengers is needed”

The ”train manager”

SWE – Ombordansvarig

NO – Ombordansvarlig

DK – Togfører

DE – ??

...is normally the overall responsible for evacuation and passenger safety



Findings - General

- **No unacceptable conditions**
- **Norway the only country with defined minimum requirements regarding number of onboard personnel**
- **Authority requirements within the studied countries are similar**
- **Internal requirements (train operators) are more or less the same**
- **Technical safety systems are different**
- **Tasks with respect to passenger safety among the safety crew are different**



Findings – Train operation

SIMILAR

- **Smoking is prohibited**
- **Standard marking of emergency exits and emergency tools**

DIFFERENT

- **Detailed requirements depending on track section more used in Denmark**
- **Communication systems and requirements are different (both related to train types and operators)**
- **Internal evacuation possibility are different (both for train types and operators)**
- **Checklists for emergency situations are being used by a few of the operators**



Findings – Rolling stock

SIMILAR

- **All operators use international fire protection regulations**

DIFFERENT

- **Traction in Denmark**
 - Requirement regarding minimum traction before entering a tunnel
- **Fire cells only in "modern" train types**



Findings – Manning

SIMILAR

- **Assignment of responsibilities among personnel**

DIFFERENT

- **Big difference in how education and training is performed among operators**
 - Practical training and "table top" education
 - Different approach and aim of education



Conclusions - Safety Crew onboard passenger trains

- Onboard personnel are of relatively less importance for the consequences of a train fire
- The technical safety solutions, choice of material, door opening function, emergency tools and marking are of significant importance for successful evacuation
- Onboard personnel do have important assignments in emergency situations
- Personnel in sight have a preventive effect against arson



What can we learn from aviation?

RULES, REGULATIONS ETC

- **Education and training**
 - More specific requirements
 - Higher demands regarding education content and recurring training/education
- **Specific defined minimum requirements regarding number of safety crew onboard aircraft**
 - Example:
 - 1-50 seats: minimum 1 cabin crew
 - 51-100 seats: minimum 2 cabin crew
 - 101+ seats: additional 1 cabin crew/50 passengers



What can we learn from shipping?

RULES, REGULATIONS ETC

- **Education and training**

- More specific requirements
- Higher demands regarding education content and recurring training/education

- Example:

Muster List

Type of checklist for emergency situation, well trained and well known among personnel



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