
8-9 APRIL 2014
interchange
CRC
for rail innovation

Project Descriptions

- R2.109 Second Generation Fatigue Risk Management Systems (Guideline)
- R2.110 Next Generation Fatigue Models

About the Project Sponsor

- Rail Industry Safety and Standards Board (RISSB)
- Produces Standards, COPs and Guidelines
- Represents industry nationally for safety matters

WHY?

- Fatigue management is in the Rail Safety National Act
- No guidance or direction is given in the Act
- Highly nebulous area previously
- Much opportunity for misinterpretation

R2:109 – FRMS Framework

- Review of current research in the area of fatigue risk management
- Review documentation from industry partners including:
  - Work hours, sleep history assessment, fatigue assessments, task rotation, napping policies, driving policies, incident investigation
- Develop draft framework
- Initial review by steering committee
- One-day workshop
- Final framework

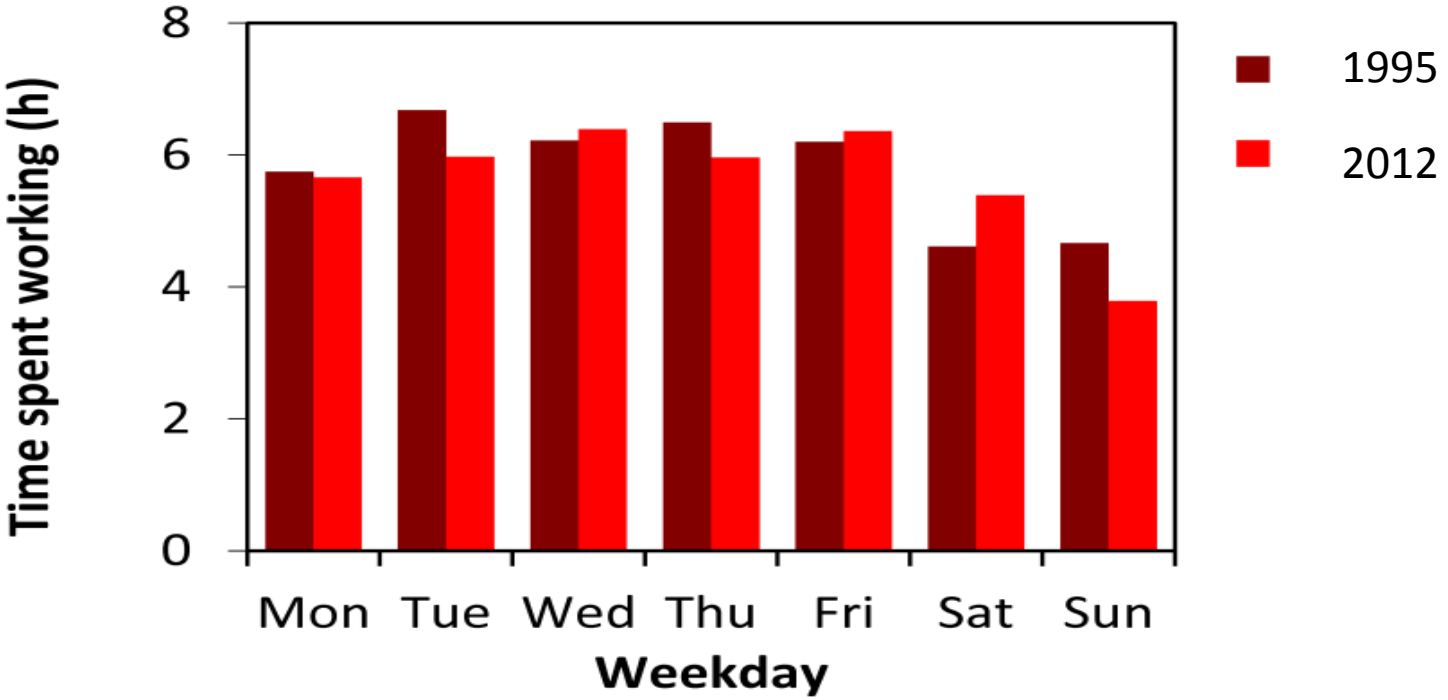
R2:109 – FRMS framework

- Size of the problem
- Conceptual framework
- Work hours dimensions
- Use of modeling software
- Training and education
- Resource package
- Commuting/driving
- Onto RISSB – wider consultation

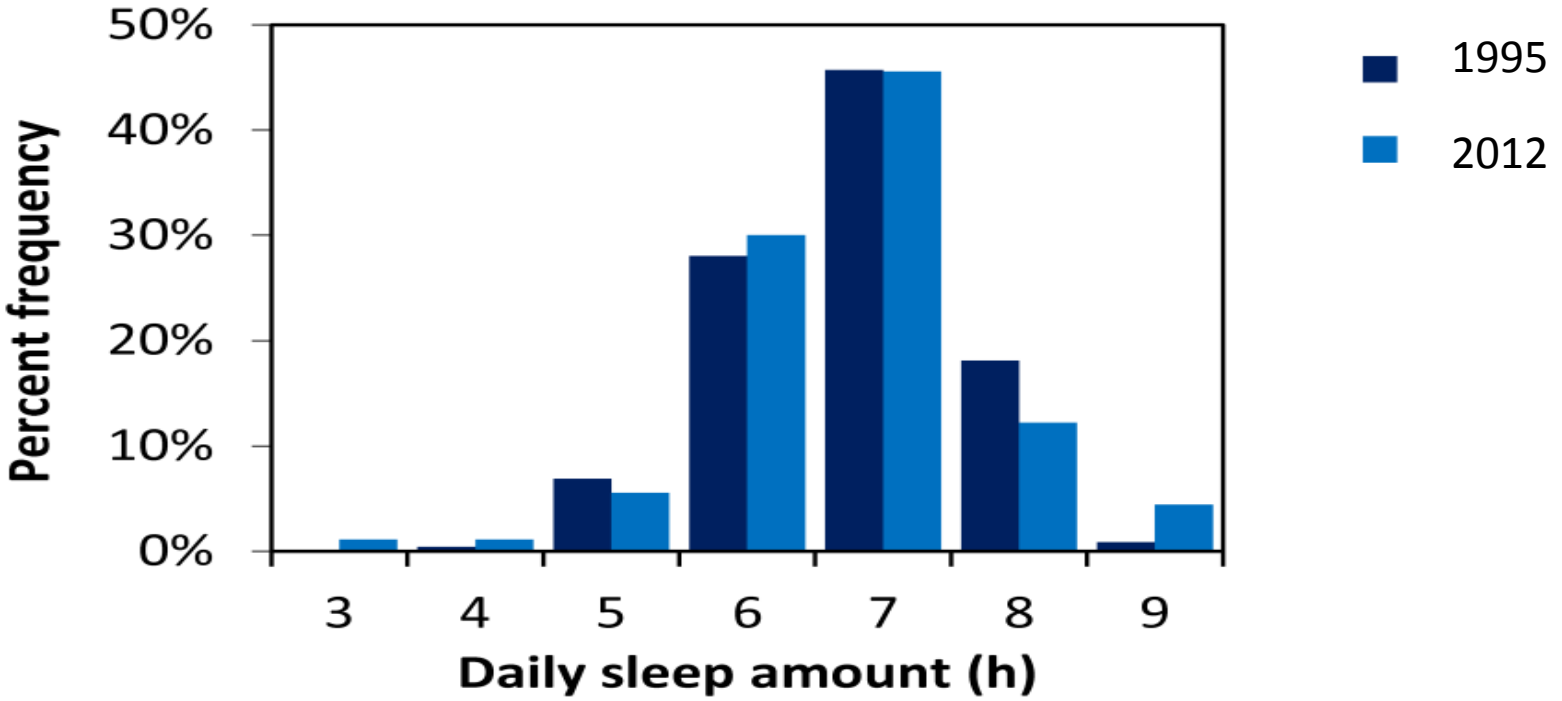
R2:110 – Modeling fatigue

- Aims:
  - Investigate the relationships between work and sleep in 2012 compared to 1995 sample
  - Analyse the distribution of prior sleep/wake scores within FAID score categories
- Methods:
  - Objective and subjective assessment of sleep and work - sleep diaries and activity monitors; work diaries and rosters
  - Roster assessment with FAID

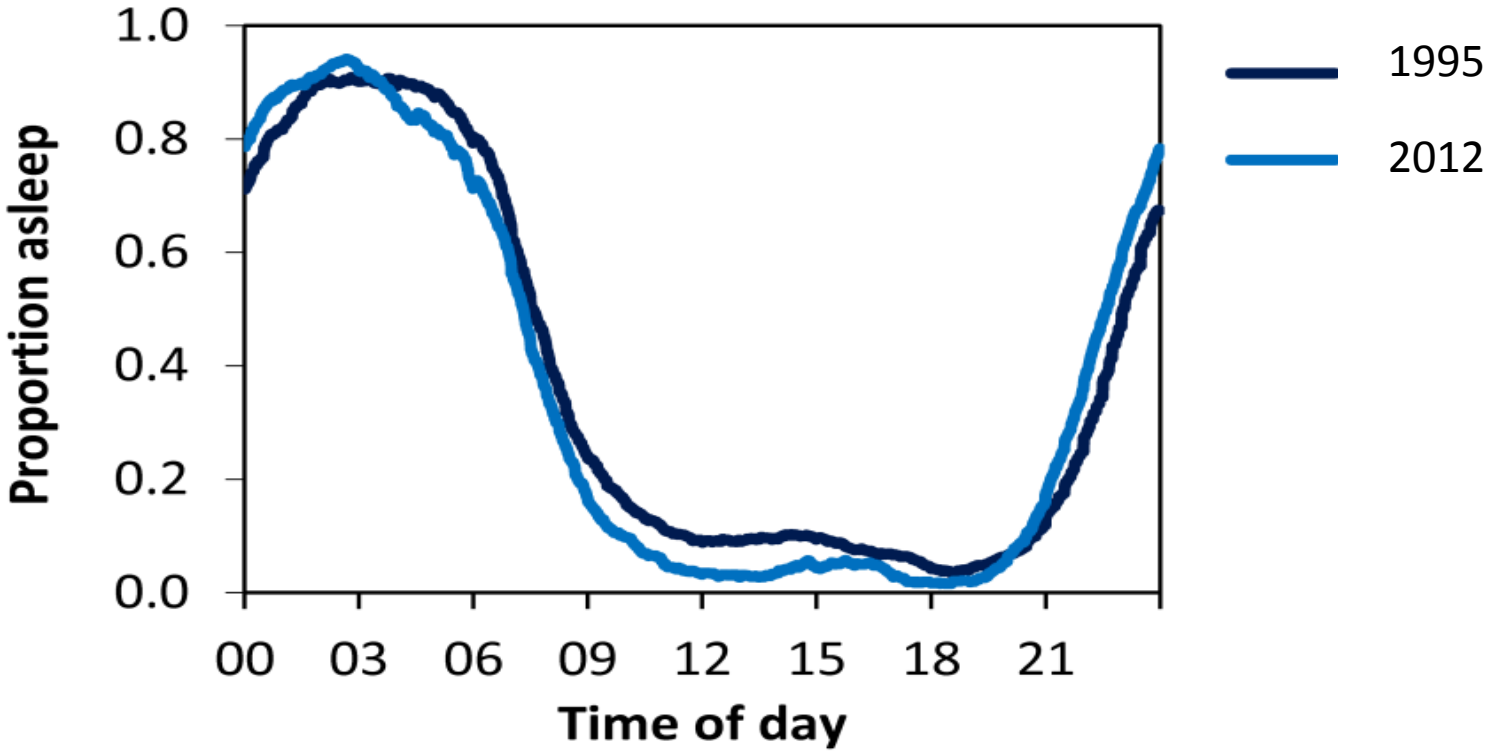
Daily work hours



Daily sleep hours



Timing of sleep



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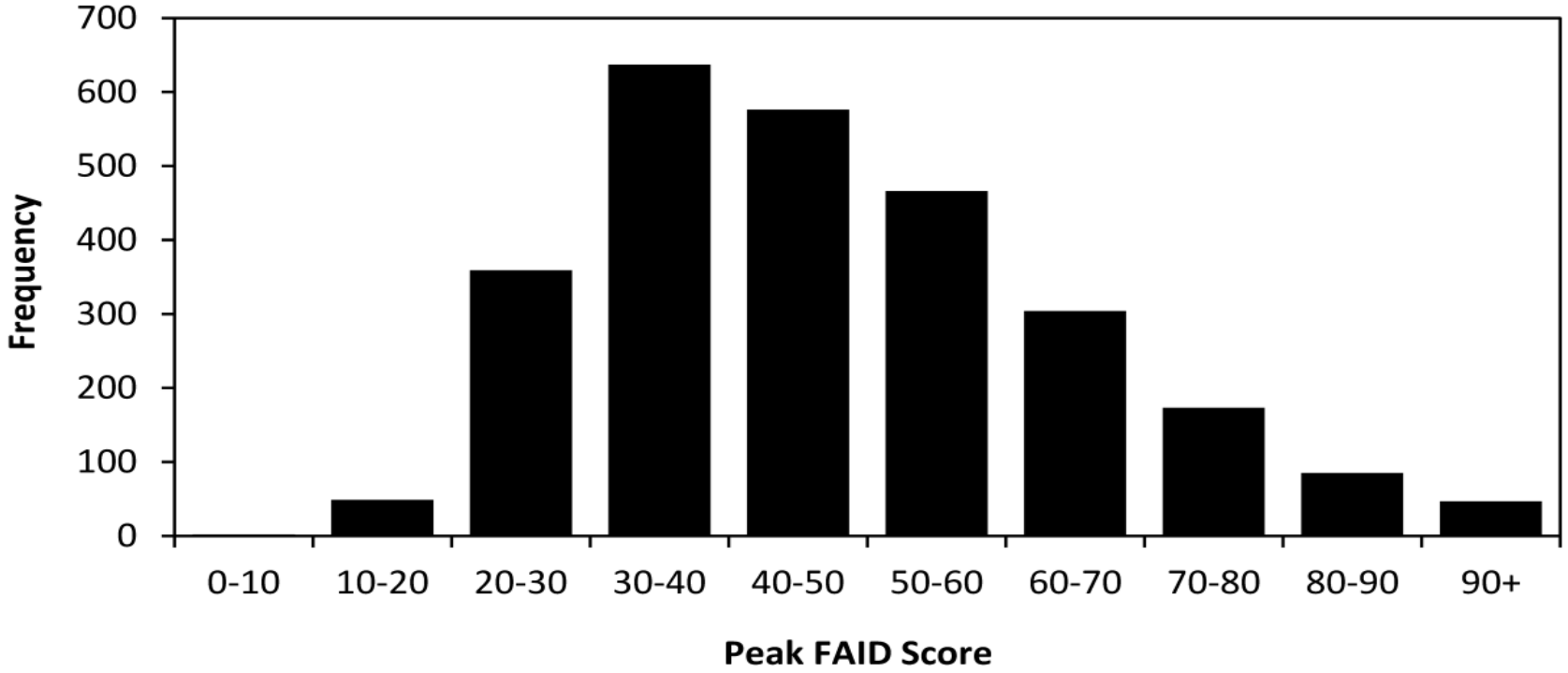
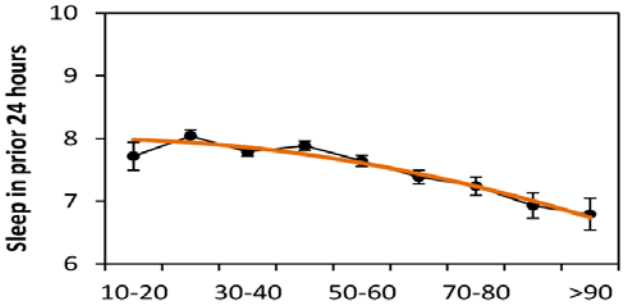
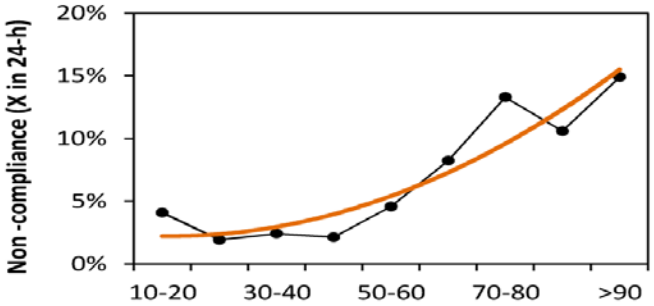
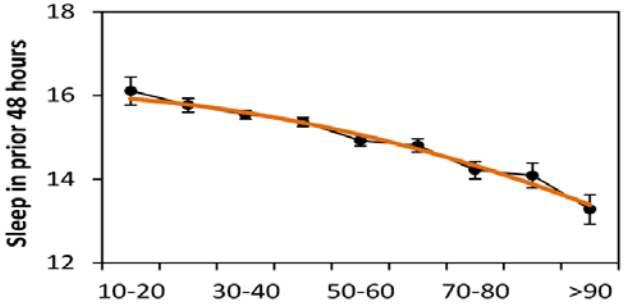
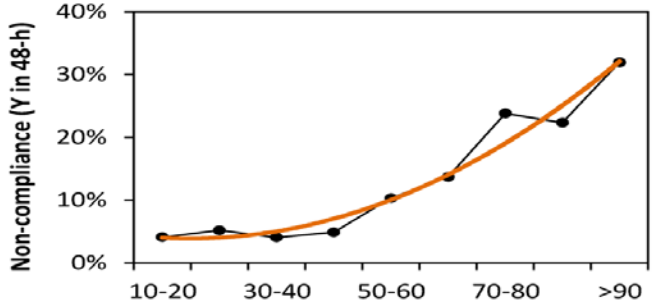
Peak FAID scores

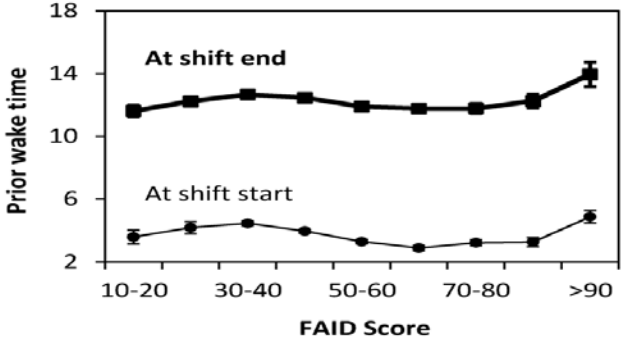


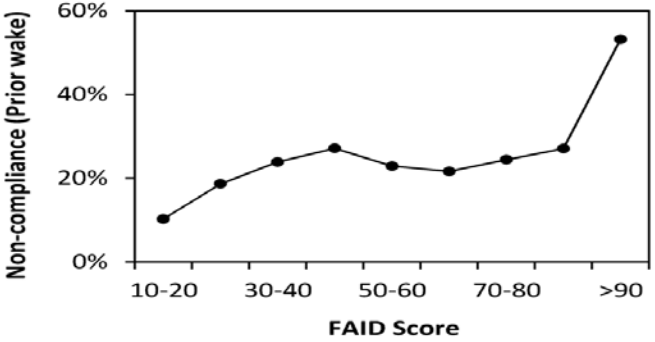

Sleep in prior 24 hours
10
9
8
7
6
10-20
30-40
50-60
70-80
>90


Non -compliance (X in 24-h)
20%
15%
10%
5%
0%
10-20
30-40
50-60
70-80
>90


Sleep in prior 48 hours
18
16
14
12
10-20
30-40
50-60
70-80
>90


Non-compliance (Y in 48-h)
40%
30%
20%
10%
0%
10-20
30-40
50-60
70-80
>90

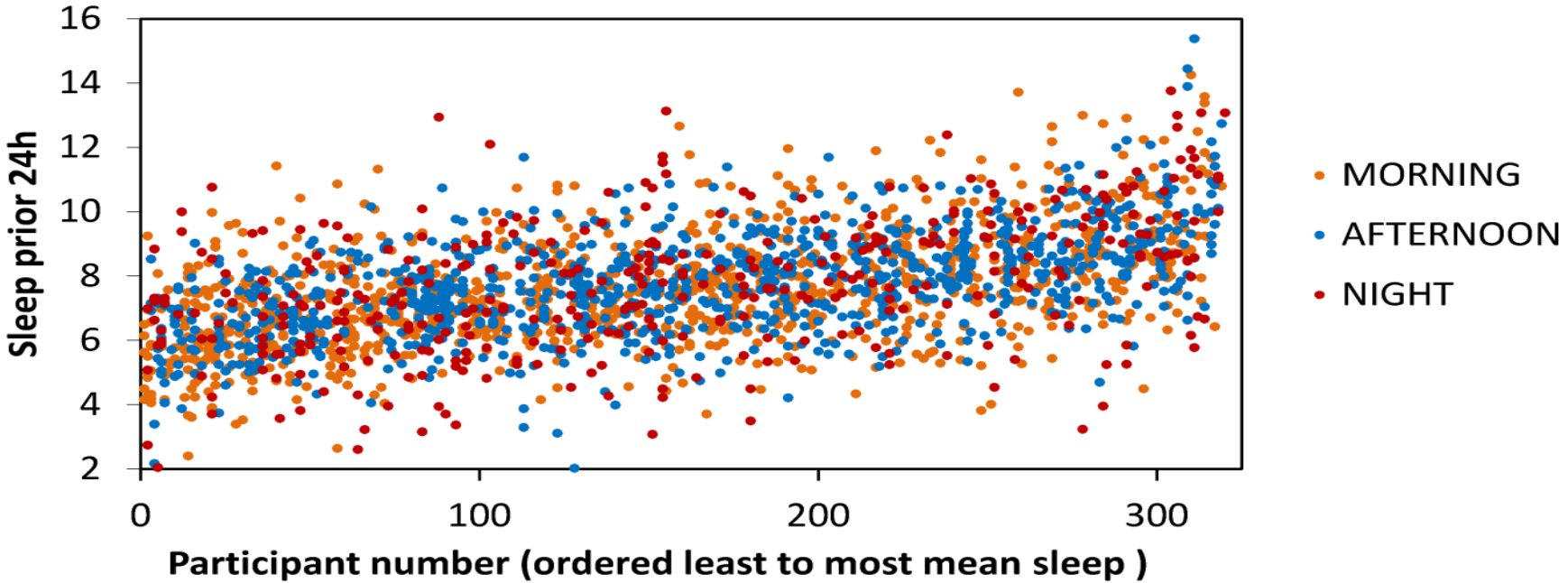

Prior wake time
At shift end
At shift start
18
14
10
6
2
10-20
30-40
50-60
70-80
>90
FAID Score


Non-compliance (Prior wake)
60%
40%
20%
0%
10-20
30-40
50-60
70-80
>90
FAID Score

Using Model Outputs

SCORE	LIKELIHOOD BAND	DESCRIPTION
0-50	Standard	Shifts with FAID scores in this range *will be approved* if standard fatigue-risk countermeasures are in place.
50-MT	Mitigation	Shifts with FAID scores in this range *are likely to be approved* if additional fatigue-risk countermeasures are negotiated.
MT+	Exemption	Shifts with FAID scores in this range *are unlikely to be approved* unless very substantial fatigue-risk countermeasures are negotiated.

Inter-individual Differences



Commercialisation of R2.109

- Research output was imported into RISSB Guideline Development Process
- Development Group formed (19 to 21 members)
- Rail Operators, Infrastructure Managers, Contractors, Regulators, NTC, ARA, RISSB
- RailCRC Author

Guideline Development

- Preliminary Draft (Output of R2.109)
- DG Internal drafts/deliberations
- 1st Public Consultation
- DG Internal drafts/deliberations
- 2nd Public Consultation
- DG Internal drafts/deliberations
- Final draft (DG Signoff)
- Safety Standing Committee Approval
- RISSB Board Approval