# Environmental management of rail maintenance and operation: follow-up of environmental performance

Kristina Lundberg, Lennart Folkeson and Berit Balfors

Department of Land and Water Resources Engineering,
Royal Institute of Technology, Stockholm, Sweden

ROYAL INSTITUTE OF TECHNOLOGY

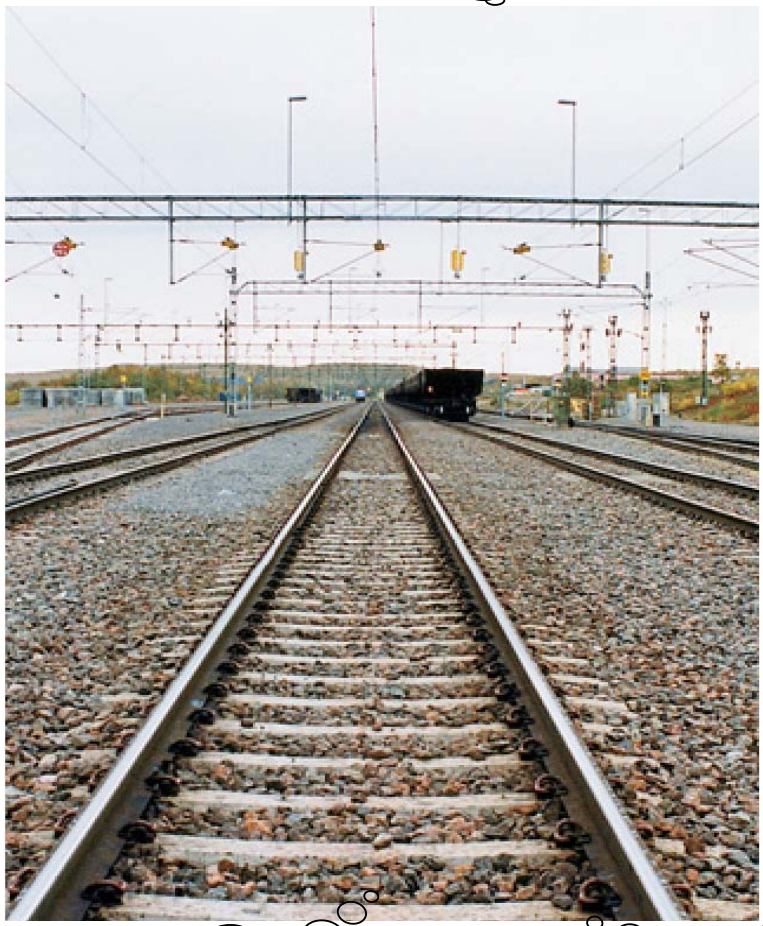
CDU

Centre for research and education in operation and maintenance of infrastructure

Waste ?

PCB ?

Pb ?



Oil and diesel spill ?

Energy usage?

Hg ?

Creosote ?

Noise ?

$CO^2$ ?

# Objectives

- To examine how environmental follow-up is performed at the Swedish National Rail Agency within the environmental management system, *EMS*
  - In comparison to other countries

- Identify existing problems related to environmental follow-up at the Swedish National Rail Agency

# Compulsory environmental follow-up at the Swedish National Rail Agency

1. Governmental directions

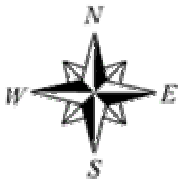
2. Transport policy goal
   -"*A good environment*"

3. Environmental management system
   A. According to the government requirements
   B. According to ISO 14001 requirements

# General problems associated with follow-up and ISO 14001

- EMS does not ensure improved environmental performance
- No environmental performance levels defined.
- Continual improvement only for significant environmental aspects

# Track Regions




Source: Banverket

# Findings

- Not certified according to EMS
- Big variation between track regions
- Implementation of follow-up routines incomplete
- Cooperation with contractors not yet fully developed

# Significant environmental aspects from operation and maintenance of railway infrastructure

| **Environmental aspects** | **Examples** |
|---|---|
| Energy usage | Use of electricity, petrol, diesel |
| Toxic pollutants | PCB, Hg, Pb, Cd, CFC, brominated flame retardants |
| Waste | Hazardous waste |
| Contaminated soils | Identification of contaminated soils |

# Conclusions

- Shortcomings with environmental follow-up according to the EMS:
  - The implementation of the routines
  - The variations among track regions
- Important to find ways for interaction of environmental follow-up between:
  - Track regions
  - Compulsory environmental follow-up