Infraestruturas de Portugal

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# RAIL TRAFFIC MANAGEMENT

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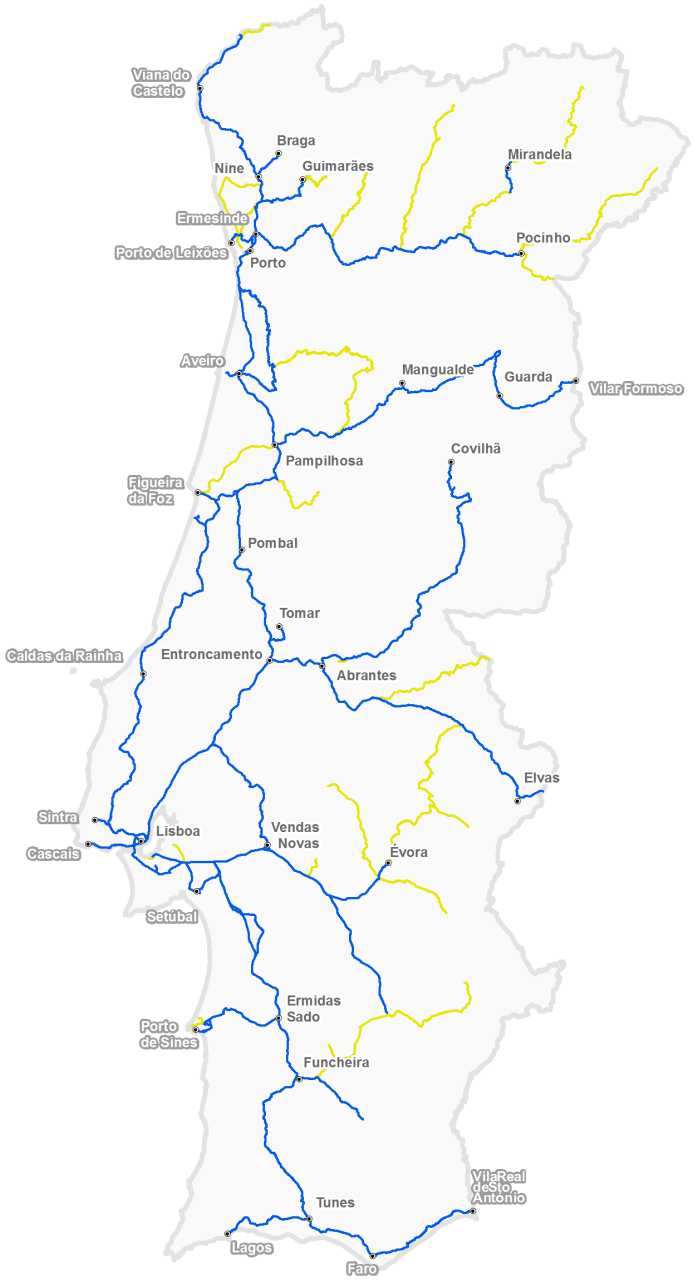
# PORTUGUESE RAIL NETWORK




# PORTUGUESE RAIL NETWORK

| | |
|---|---|
| **LINES IN OPERATION** | **2.544 km** |
| **CLOSED LINES** | **1.075 km** |

| **2000 Trains / day** | **37.000.000** Tk / year |
|---|---|
| ✓ 5 % IC & Alfa | ✓21 % IC & Alfa |
| ✓22 % Regional | ✓28 % Regional |
| ✓63 % Suburban | ✓35 % Suburban |
| ✓10 % Freight | ✓16 % Freight |

# Railway Network Management

## SIGNALING and TELECOMMUNICATIONS

Electronic and electric signaling

**1 740 km** [*]

Mechanical Signaling

**806 km**

## LEVEL CROSSINGS

**877**

With active protection — **435**

Without active protection — **442**

## SECURITY SYSTEMS COMMAND AND CONTROL

Convel Ericab 700

**1 740 km** [*]

Radio Solo-Comboio (RSC)

**1 631 km** [*]

| BRIDGES | TUNNEL | STATIONS/ STOPS | ELECTRICAL SUBSTATIONS | |
|---|---|---|---|---|
| 2379 | 124 | 924 | 28 | TOTAL |
| 2128 | 90 | 564 | 28 | **Exploitation** |

[*] 90% of all trains

# EVOLUTION OF
# RAIL TRAFFIC MANAGEMENT IN PORTUGAL

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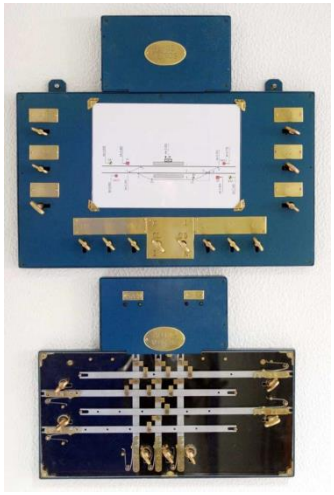
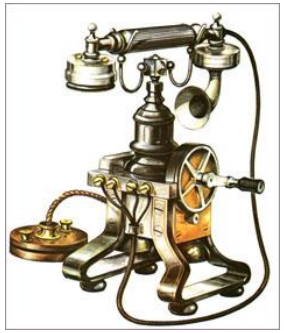
# RAIL TRAFFIC MANAGEMENT IN PORTUGAL

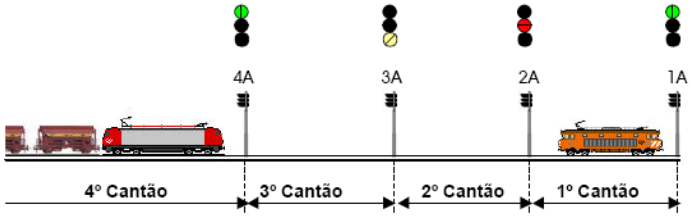
## Traditional Systems

***Telephonic control***





***Electrical signalling***




# Electronic Signalling/ATC installed in the 90's


***Centralized Traffic Control***

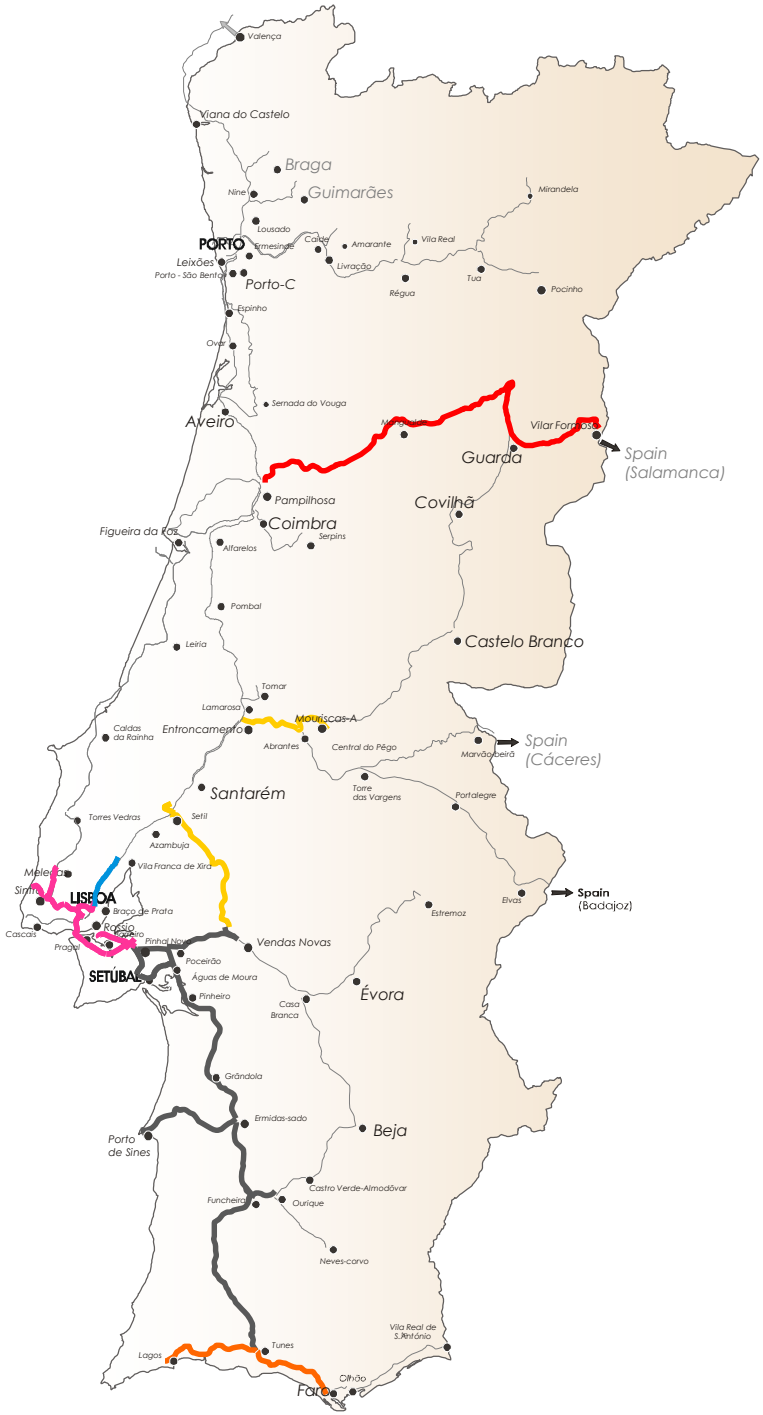
***CTC - installed locally***

**For the first time we can command traffic from a Command Centre and not just control**

# CTC in 2004

**3 electronic signaling technologies:**

- **SSI, supplied by Dimetronic**
- **PIPC, supplied by Alcatel**
- **ESTW, supplied by Alcatel**




PAMPILHOSA CTC
ENTRONCAMENTO CTC
ORIENTE CTC
CAMPOLIDE CTC
SETÚBAL CTC
FARO CTC

## The Beginning

With traditional systems, control centers were limited to record and control the movement of the trains. Railway stations had the effective command of the circulation.

**New Technology**

## THE RECENT PAST

With Electronical Signaling were born first CTC

For the first time we can command traffic from a Command Centre and not just control

First CTC (Pampilhosa) was born in 1995, and commands all Beira Alta line

# Traffic Management

**In Portugal CTC were born**

- **Only as a modernisation and investment opportunities**
- **Developed from an exclusively engineering point of view with no focus on clients**
- **As stand alone projects, independent of one another**
  - ✓ **hard to adapt to new situations,**
  - ✓ **limited in its expansion capability**

**They become disarticulated and incoherent for integrated rail network operation**

**And they revealed a lack of effective command in case of problems**

# 2004 - WHAT TO DO ?

# STRATEGIC PLAN

# STRATEGIC PLAN

**No longer the same mistakes we have done**

**Strategic Planning – focus in Operations and Customers needs**

**Adapting command to the requirements of an integrated railway operation**

**Integration of all functions that contribute to the availability and reliability of Infrastructure to allow a quick response of all systems**

**Definition of geographical boundaries and integration of all lines of Portuguese Network**

**Transform old CTC into real**

# STRATEGIC PLAN

## IMPORTANT ASPECTS

**Reduction of CCO number (3)**

**Defining their boundaries** (avoid the existence of borders between CCO in areas of mutual penetration of intense traffic flows or neighboring major traffic generators poles)

**Preparation of the basic program, specifically for each CCO**

**Gradual implementation of CCO** (integration of former CTC without breaking the continuity of provided services)

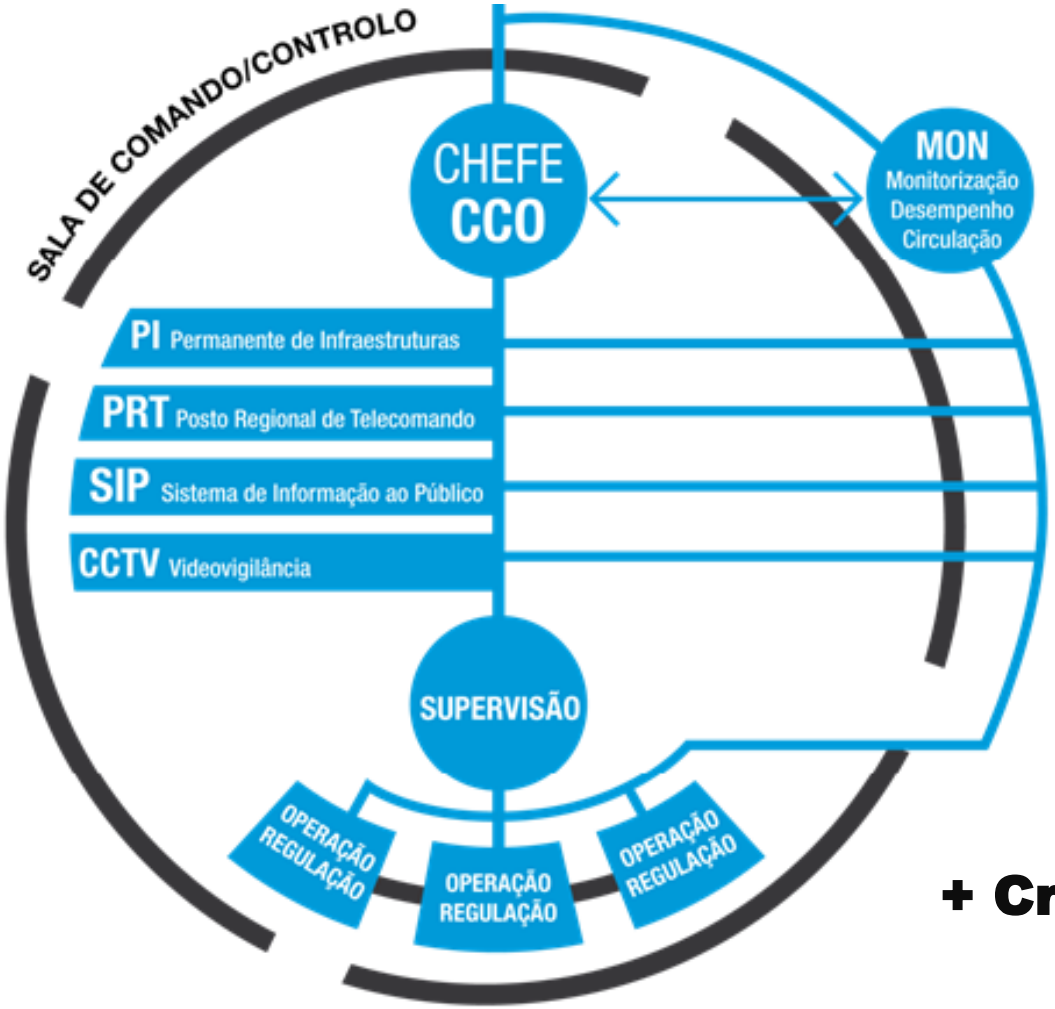
**Size of rooms namely the control room**

**Allocation of space** (to study the best allocation of space taking into account the interrelation between the different systems and their functionality)

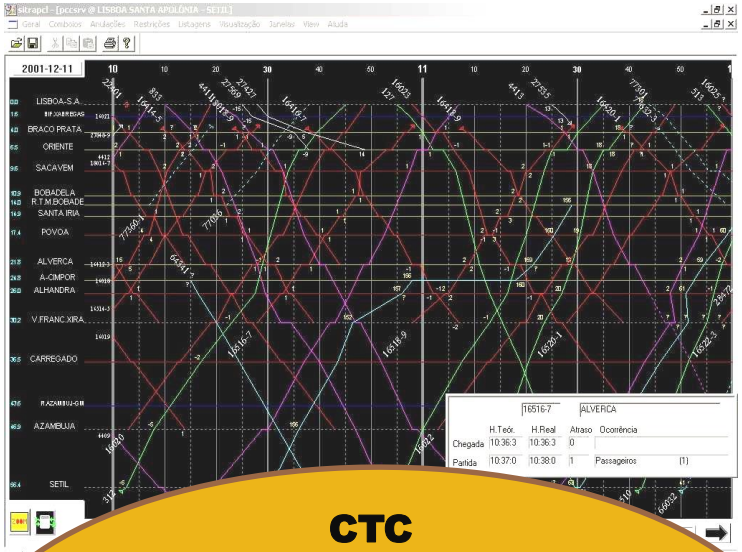
**Working conditions** (It is important to take care of ergonomics, lighting, soundproofing, type of equipment, and all the features needed to improve working conditions in the CCO)

# CCO - CONCEPTUAL MODEL

# INTEGRATED FUNCTIONS




**+ Crisis Room**

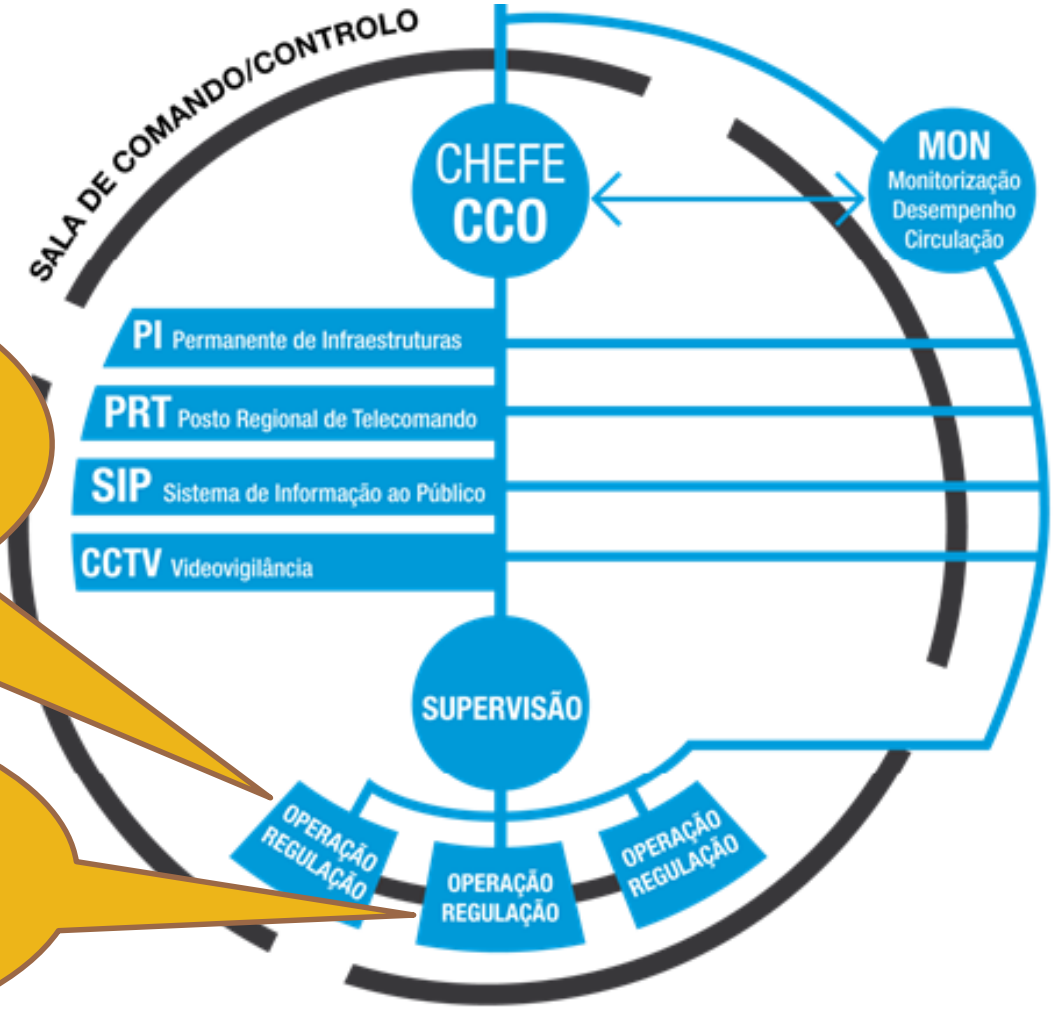


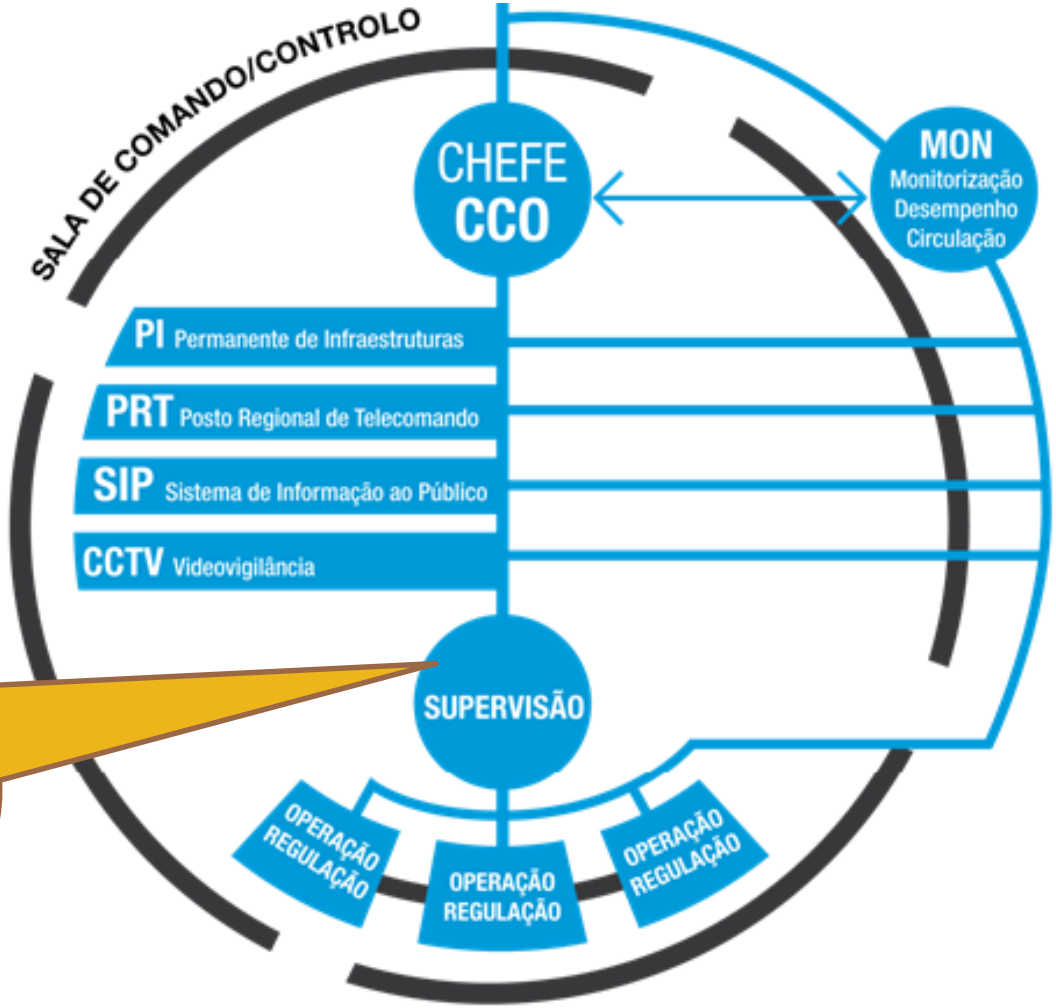
**CTC**
**Centralized Traffic Control**

**For sections with electronic signaling. Allow the effective traffic control and command**

**Traditional Traffic management**

**For sections not equipped with electronic signaling**






**Traffic Supervision**

**Coordination and optimization of tasks to be carried by traffic operators**

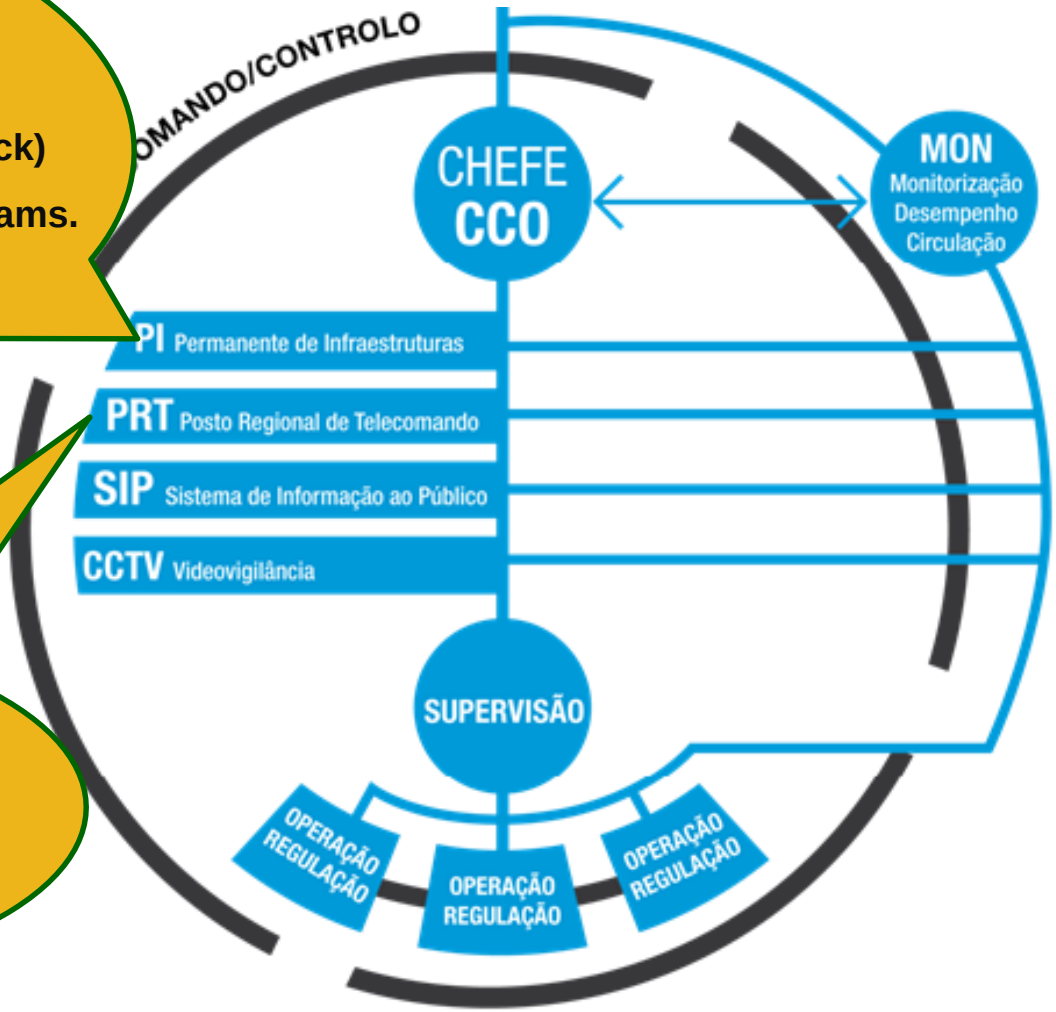
**Daily contacts with TOC**

## Infrastructure function

Equipment monitoring (stations, Track)

Mobilization of repair/intervention teams.

Monitoring of planned works




## Remote control of energy in catenary

Monitoring

Acting if needed


## Chief of CCO

Functional command of all people in control room

## Public Information System

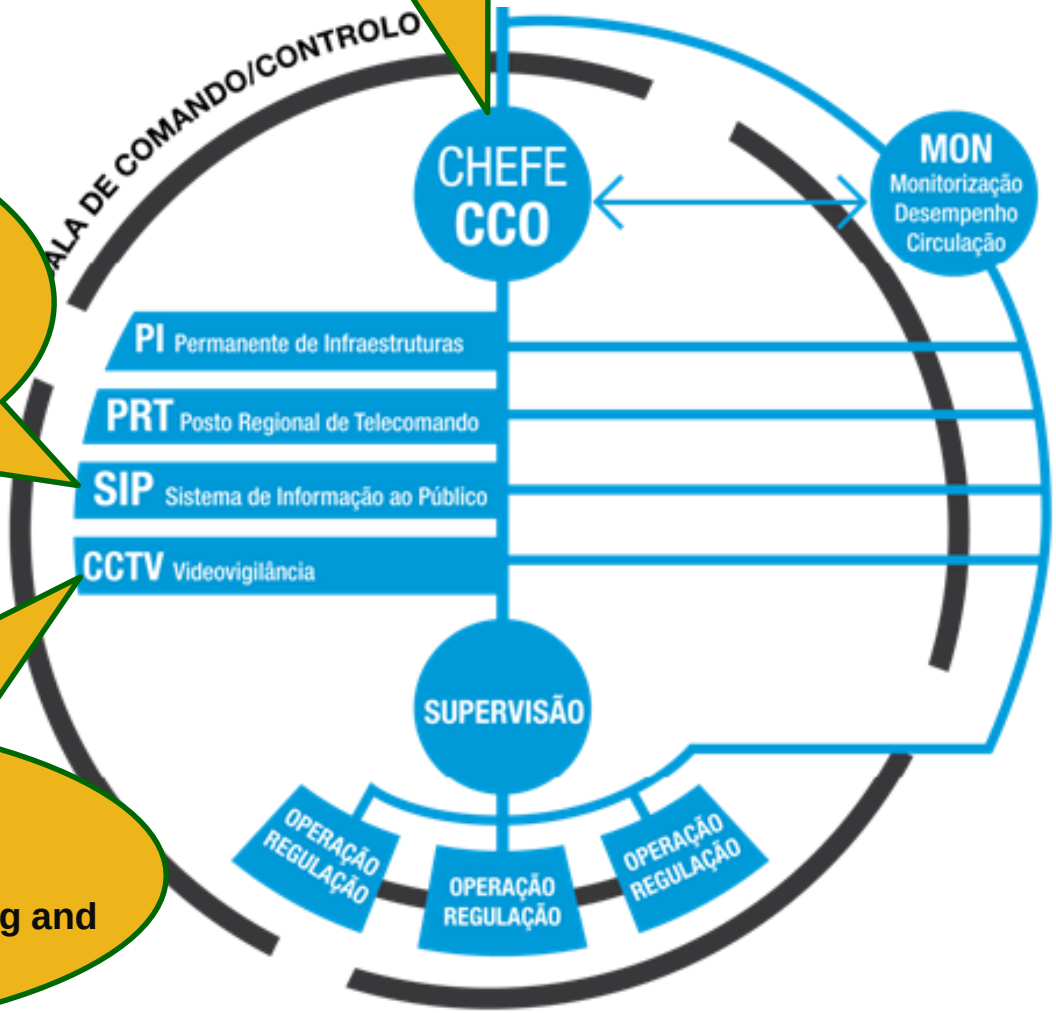
Automatic

People intervention whenever necessary

## Video Surveillance

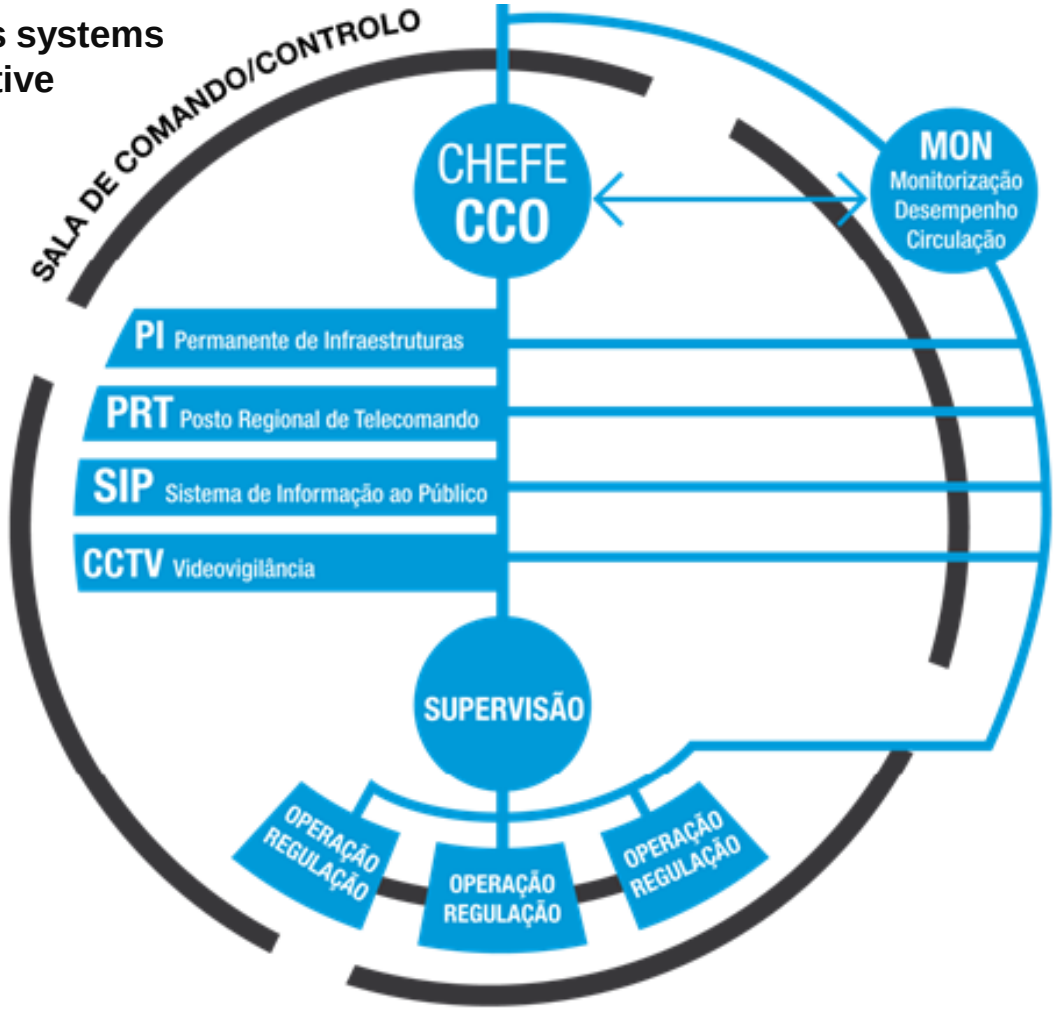
Related with train movements

Selective viewing, recording, collecting and saving images.



# Telecommunications

Control of telecommunications systems
Necessary for effective support of all CCO functions




## Train Performance Monitoring

Identification of train delays and causes.

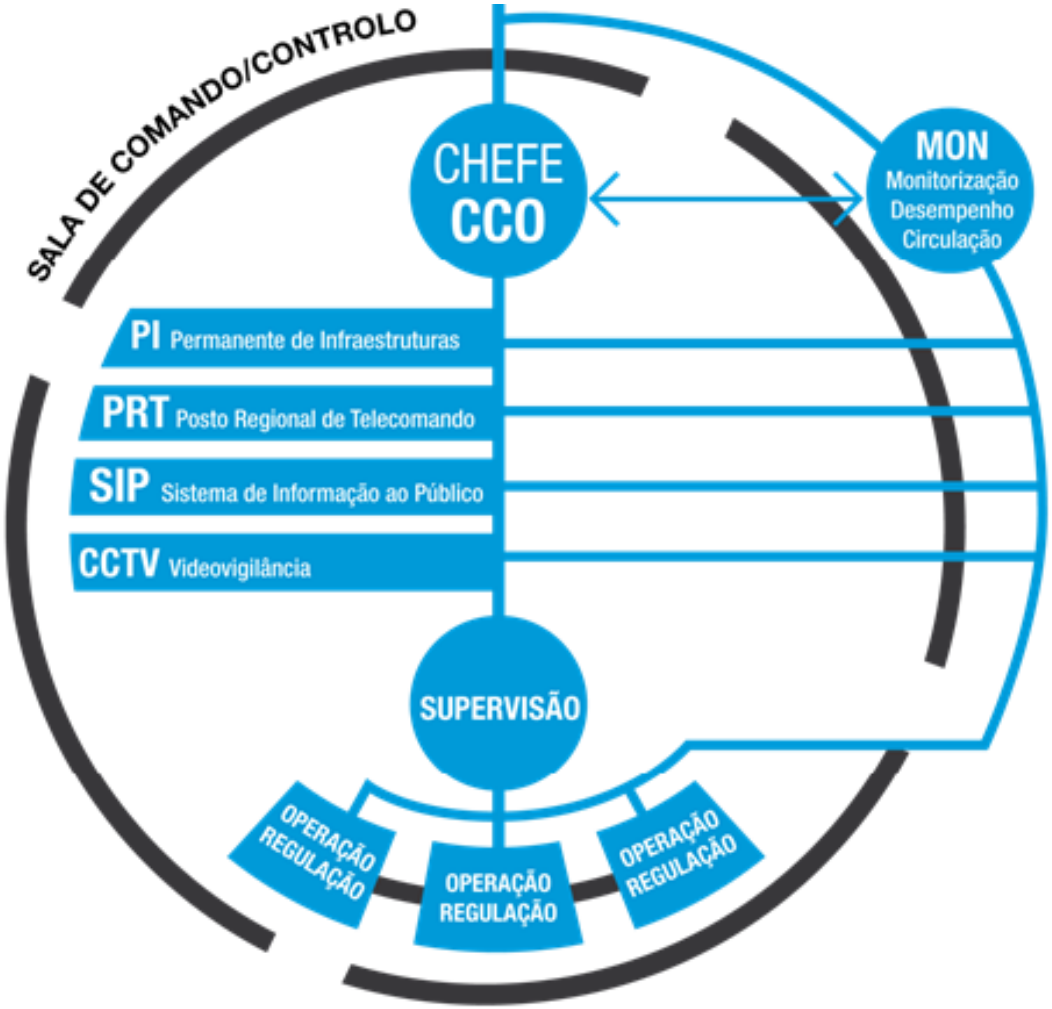
Allocation of responsibilities

Development of Key performance indicators

# Crisis Room

**It brings together foreign elements in the event of serious disturbances without disruption of the control room.**

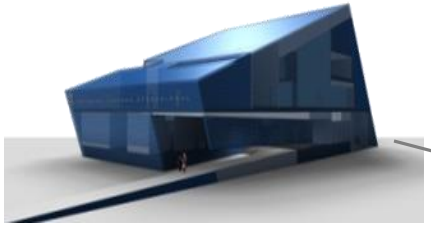
**It is possible to import to the crisis room all the information of the existing systems in the control room**



# OPERATIONAL COMMAND CENTER (CCO)

# OPERATIONAL COMMAND CENTER (CCO)

- **650 Trains/day (23%)**
- **592 Km of track**
- **68 Workers**



***CCO Porto***
***April 2008***

- **1650 Trains/day (70%)**
- **1263 Km of track**
- **144 Workers**

***CCO Lisboa***
***November 2007***

- **150 Trains/day(7%)**
- **691 Km of track**
- **46 Workers**

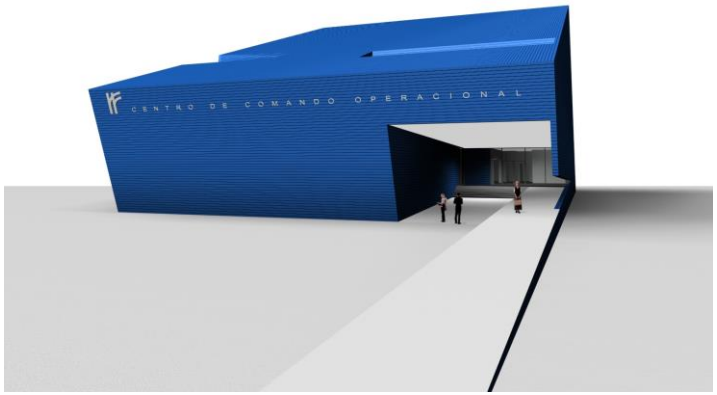
***CCO Setubal***
***1º Semester 2010***

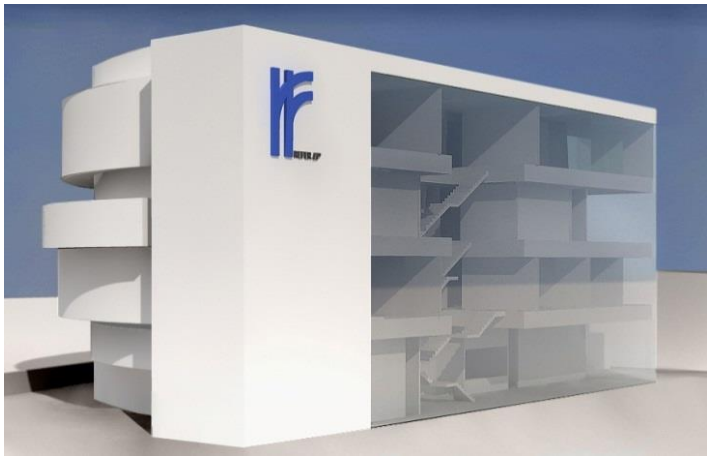
# OPERATIONAL COMMAND CENTER (CCO)

**CCO's in Portugal were pioneers of a new form of railway management**

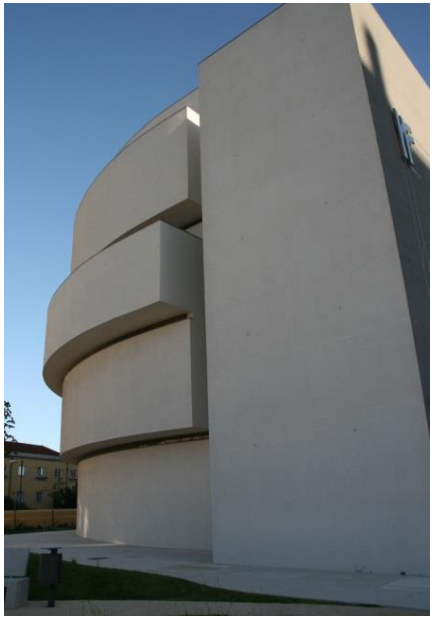
**Integrating in the same control room all IM functions that contributes to railway operation**

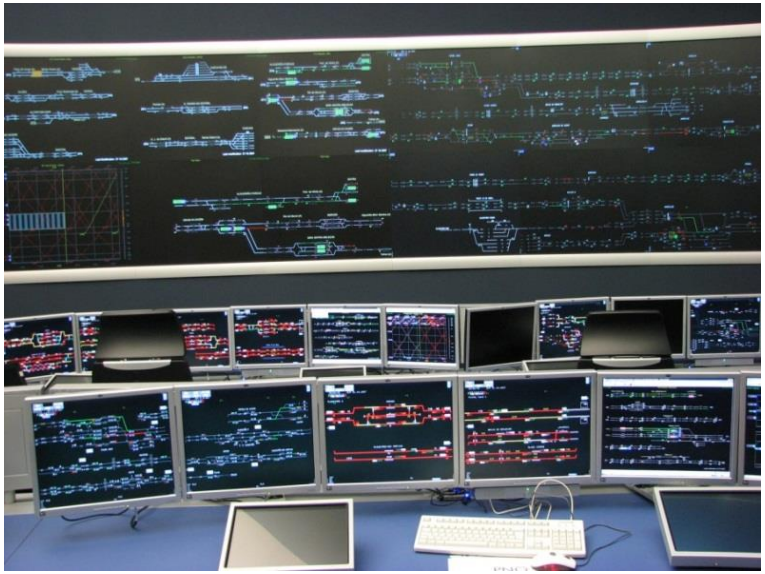
**CCO represents a significant modernization of the services provided by IP at the forefront of the most efficient practices for transport infrastructure management**



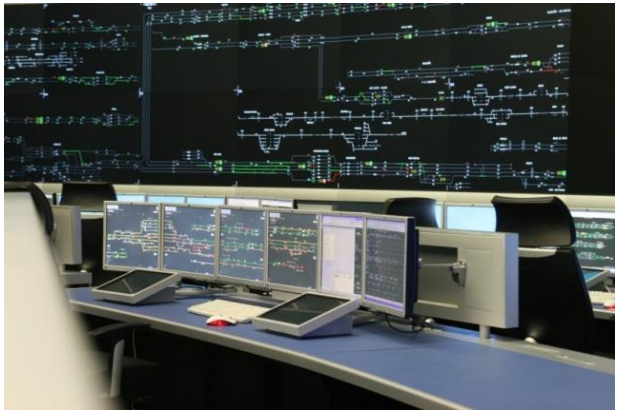



# CCO

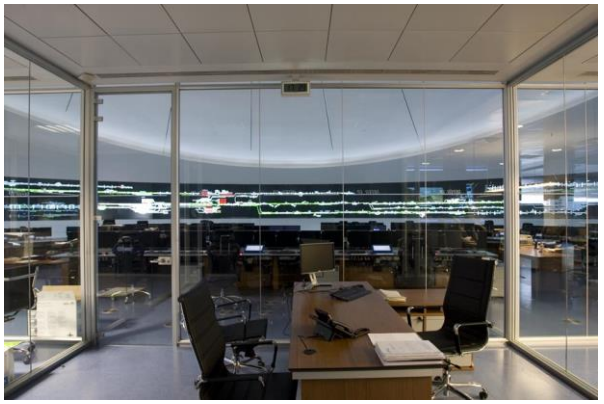


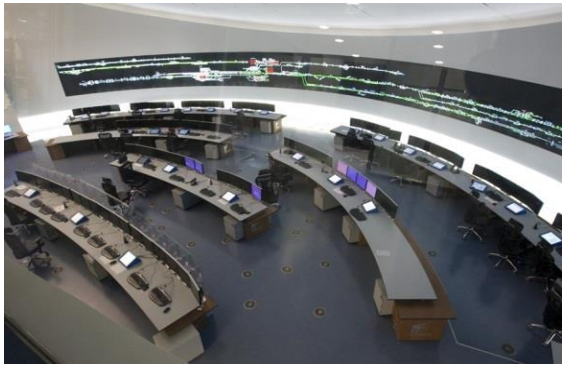


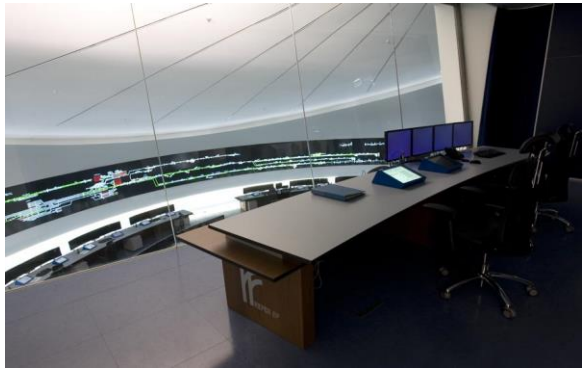
# CCO Lisboa

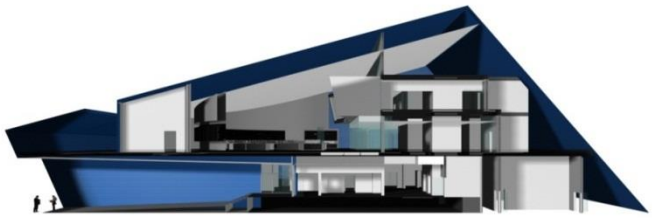



# CCO Porto









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Rodovia e Ferrovia

**Juntos encurtamos distâncias.**

# THANK YOU

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