

Presentation at the Second Plenary Meeting  
of the Advisory Committee on Acoustic  
Impacts on Marine Mammals  
28-30 April 2004  
Arlington, Virginia

*This presentation is the sole product of the author(s) and does not reflect the view of the Marine Mammal Commission or the Advisory Committee on Acoustic Impacts on Marine Mammals.*



# Acoustic Environment Risk Management for Marine Mammals

Claire Burt

Dstl Naval Systems Department

Tel +44 1305 256025

email [CMBURT@dstl.gov.uk](mailto:CMBURT@dstl.gov.uk)

# ENVIRONMENTAL IMPACT

*“ ...carry out environmental policy appraisals of all new or revised policies and equipment acquisition programmes and environmental impact assessments of all new projects and training activities”.*

*• “Where the Ministry has been granted specific exemptions, disapplications or derogations from legislation, international treaties or protocols, Departmental standards and arrangements are to be introduced which will be, so far as is reasonably practicable, at least as good as those required by the legislation. I will only invoke any powers given to me to disapply legislation on the grounds of national security when such action is absolutely essential for the maintenance of operational capability.”*



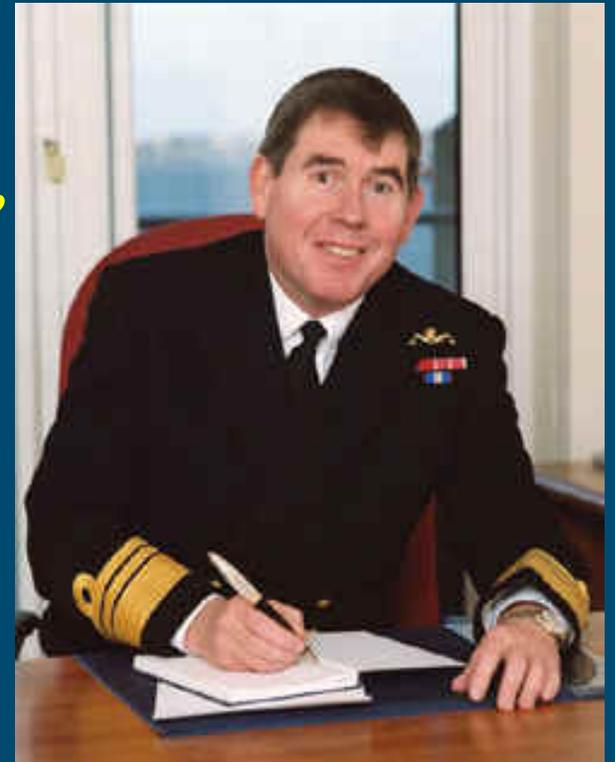
# ENVIRONMENTAL IMPACT

- **CINCFLEET RN Safety Management System dated 21 Mar 02:**
  - *“All practicable and reasonable steps, consistent with maintaining operational effectiveness, are to be taken within the RN in accordance with this RNSMS.”*
  - *“Protect and enhance the natural environment in line with HM Government’s Environmental Strategy and the principles of stewardship and sustainability, within overriding operational constraints.”*
- **In summary, the aim is to achieve/maintain operational effectiveness with due regard for environmental legislation by taking any necessary measures to protect the environment.**

# ENVIRONMENTAL IMPACT

*'...it is now timely and appropriate to issue guidance on the use of in-service active sonars. The guidance is designed to be straightforward, to bring clarity to this requirement and will provide an initial mitigating measure against marine mammal disturbance ahead of the longer term measures....' 28 Nov 03.*

*Vice Admiral Mark Stanhope OBE  
Deputy Commander in Chief Fleet*



# Current Environmental Protection Capabilities

**Environmental Impact Assessments (EIA) undertaken to support:**

- **Sonar development and acceptance trials**
- **New training and exercises**

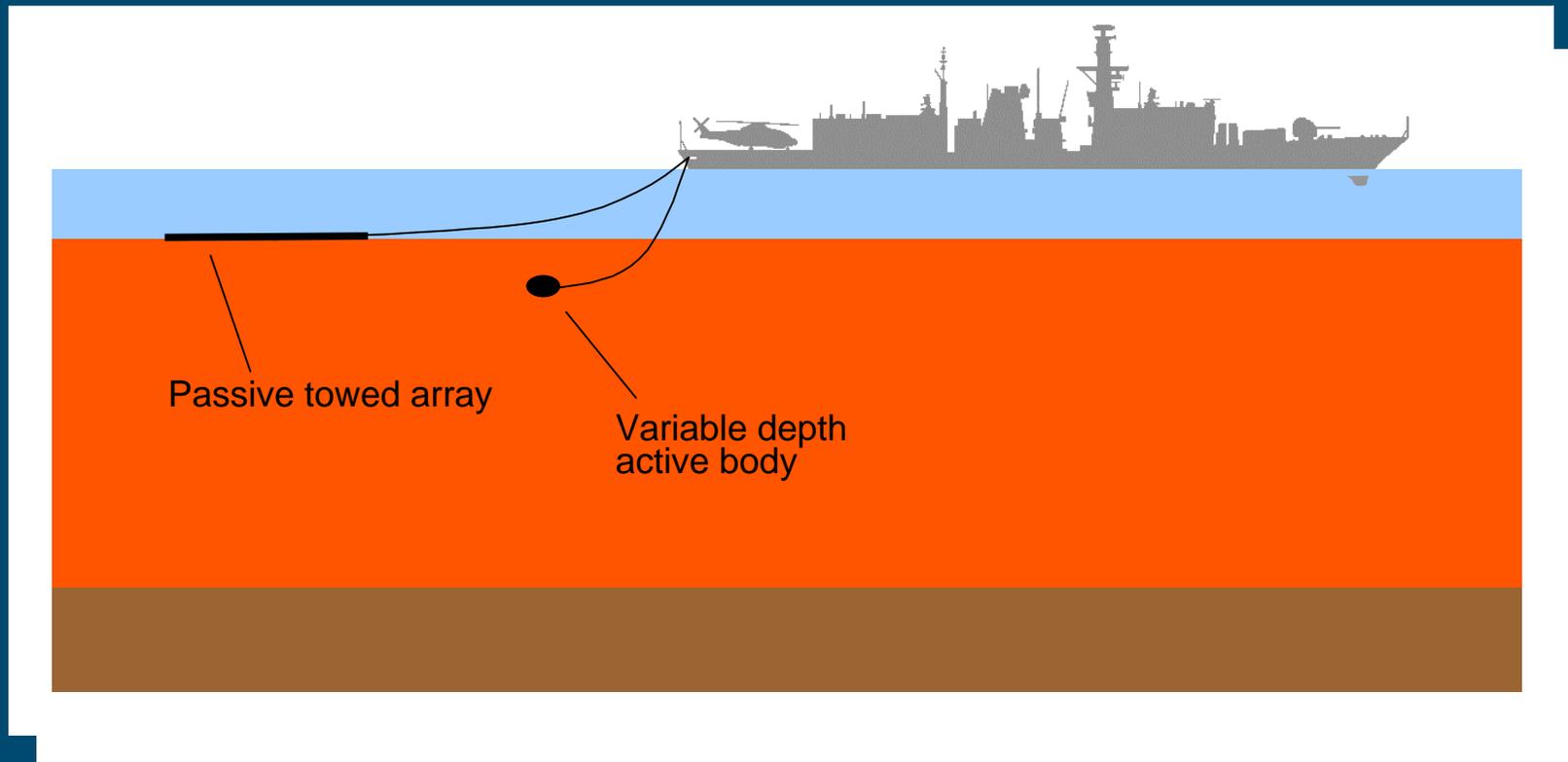


# Marine Environmental Impact Assessment

- **Anti-Submarine Capability for Type 23 Frigates includes active and passive sonar systems.**
- **EIAs are undertaken for some of the active sonar systems**



# System Illustration



- Scope of EIA Work
- Acoustic Impact Criteria
- Mitigation Actions
- Effect on Operations
- Future Development

# Environmental Requirements (1)

- **Policy cascades down from Secretary of State Policy Statement**
  - JSP 418(3) - MOD Environmental Policy
    - DPA Environmental Management System
- **Formal assessment of the risks associated with procurement trials and operation of sonar specifically:**
  - Comply with Environmental Law
  - Undertaking of Environmental Impact Assessments (EIAs)

# Environmental Requirements (2)

- **Sonar IPT is tasked to maintain the balance between the equally important need to maintain operational capability whilst at the same time protecting the natural environment**

# Route Map

## Global EIA

### Impact on Receptors (Humans/Mammals/Fish)

- Likely Areas of Operation
- Legal & Policy

### Trial Specific EIA

### Migration into Operational use

# Mitigation Procedures

## Before each Trial:

- **Assess Area**
- **Establish Mitigation Action (Zones etc.)**

## Monitoring

- **Before, During & After Trial**

**Trials monitoring and mitigation strategy is not sufficient of itself  
Assessment of effectiveness of measures and application to  
in-service use of the system.**

# Mitigation Measures (1)

## Derived from EIA;

- **Avoidance areas to be implemented with respect to sensitive areas and habitats for marine mammals (Based on PTS/TTS)**
- **Measures to protect human beings, in particular divers and swimmers , in coastal areas (Based on DA)**

# Mitigation Measures (2)

- **Visual and passive acoustic monitoring for marine mammals to be undertaken from the source ship and during trials from an independent environmental monitoring platform**
- **Avoidance of areas where fish spawning is likely to occur and monitoring for potentially visible fish species (eg Basking Shark)**
- **Modification of the sonar trials programme in response to environmental monitoring (eg: cessation, temporary reduction or relocation of sonar transmissions, use of “soft start”)**

# Acoustic Impact Criteria

- **DA - Diver Aversion**

- **Diver behavioural response to underwater sound - research based on sonar frequencies**

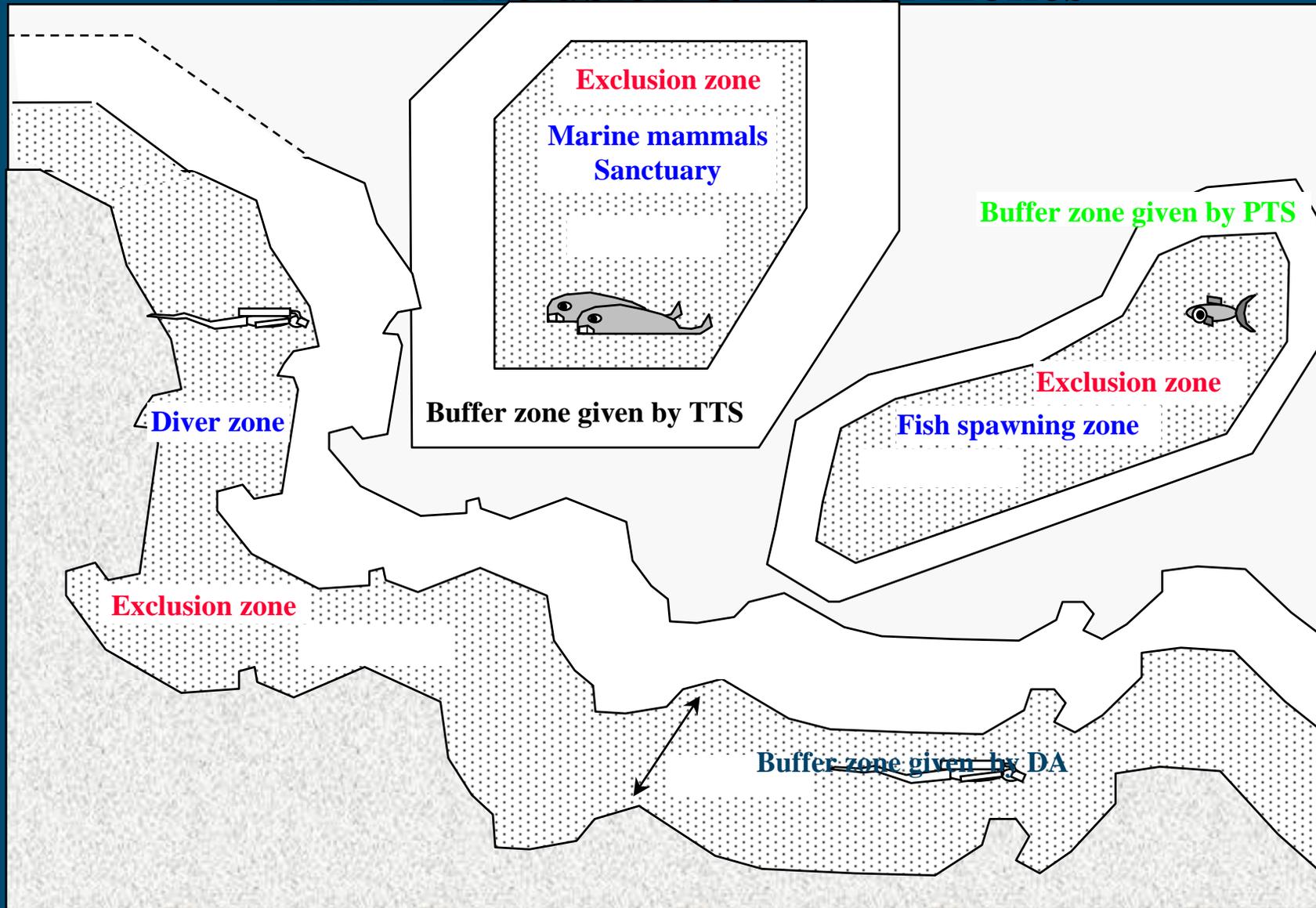
- **PTS - Permanent Threshold Shift**

- **PTS is irreversible physiological damage, caused by rupture of the hair cells of the inner ear, resulting in a permanent loss of hearing sensitivity.**

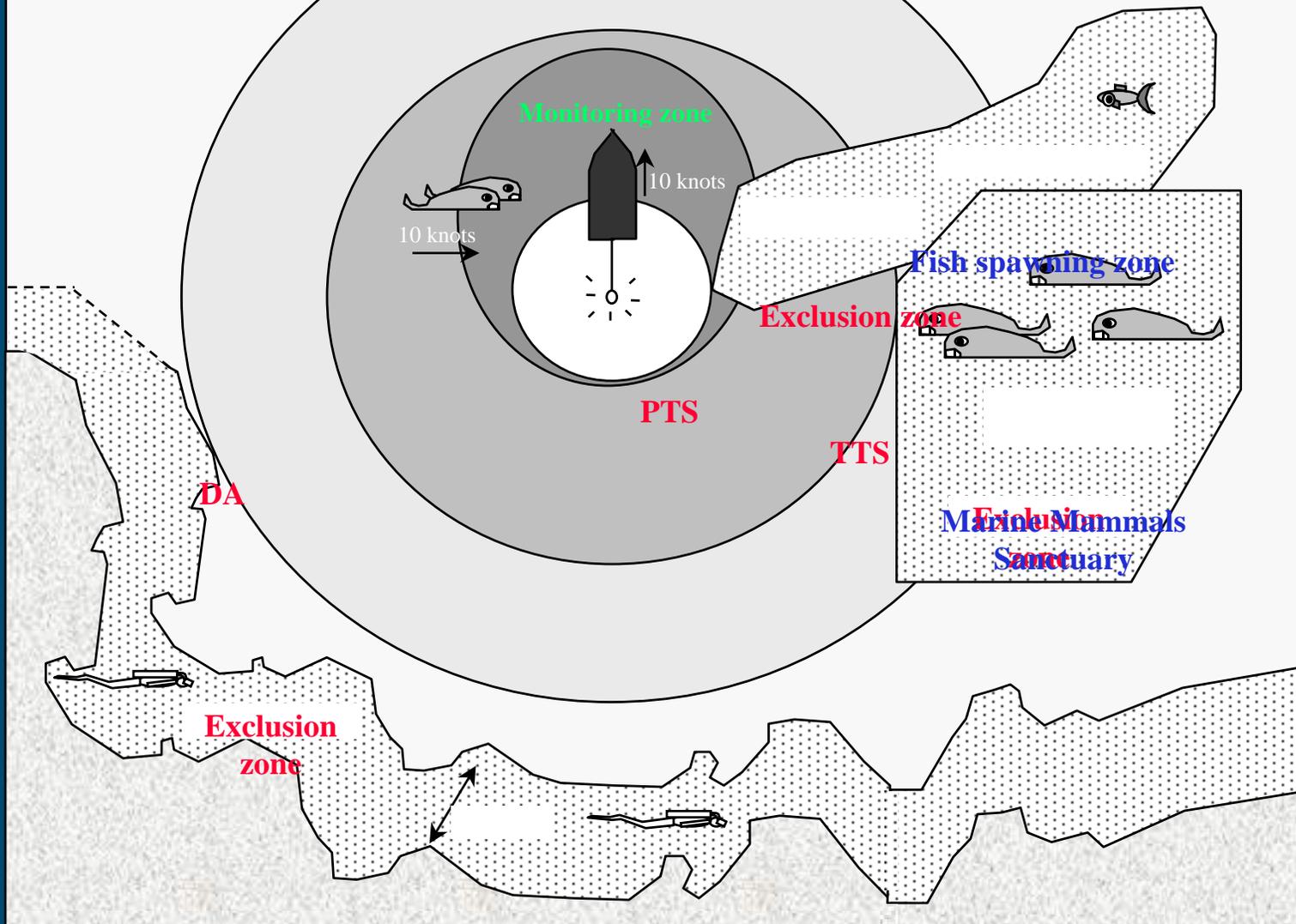
- **TTS - Temporary Threshold Shift**

- **A temporary loss in the efficiency of the mechanical - chemical-electrical transfer function in the inner ear, resulting in the loss of hearing sensitivity.**

# EIA - Exclusion & Buffer Zones



# EIA - Deployment of Sonar System



# Acoustic Impact

- Calculation of Stand-off range (SOR):
  - Distance at which SPLs fall to within prescribed safe limits (varies as a function of sonar operating power, frequency, duty cycle and length of transmissions, as well as the environment in which the sonar is operating)
- SORs are used to define:
  - Buffer Zones - placed around sensitive sites to create exclusion zones where the sonar will not be operated, and
  - Monitoring Zones, which are placed around sonar operating platforms, to signify the area in which monitoring will be undertaken to detect the presence of marine mammals

# Assessment of Trials/Training Areas

## Planning:

- **Known Areas**
- **Historical data (inc Environmental)**

## Execution:

- **Obtain real time data**
- **Refine/recalculate SORs based on actual water conditions**
- **Modify plan/apply mitigation**

**(All activity derived using the Precautionary Principle)**

# STUFT 1 Trial



**Trials Ship PELAGIA with sonar deployed**

# STUFT 1 Trial



Environmental monitoring  
Platform RV TRITON

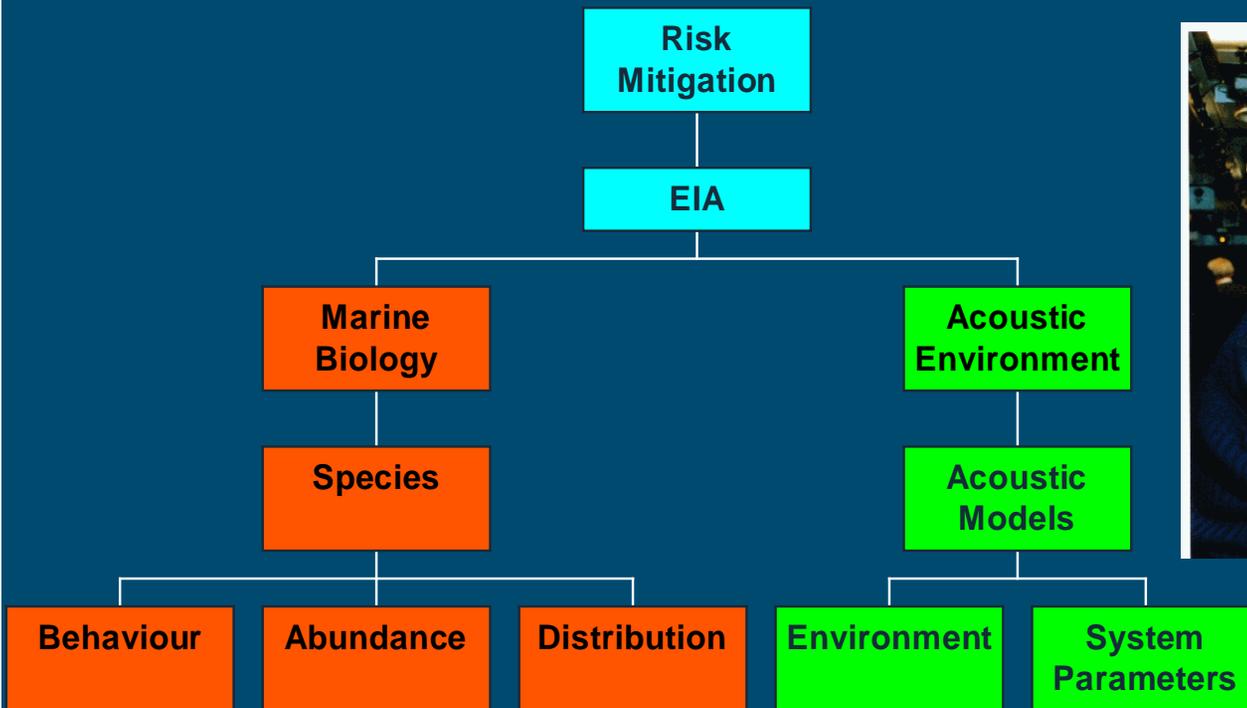


Visual Monitoring

# Status of EIA Work

- Global EIA-Living document
- EIAs for 1st Sea Trial Aug 02, April 03, next Trial Jun 04 (NW Apps) -in preparation
- Liaising with OGDs (DEFRA, FCO)
- Close Working with US

# Concept for RN Environmental Risk Management Capability (ERMC)



# Transition to In-Service

- EIA work, process, ERMC , “Single statement of need”

“ERMC(S) is to provide a robust, repeatable and transparent method to assess the environmental impact of sonar activity on marine life and to manage this impact by providing advice on mitigation measures. It must be adaptable through life to satisfy the requirements of future legislation, policy development and scientific advances “

Risk based approach to in-service monitoring and mitigation measures, coherent with organic sensor capabilities

- Interim solution is applying Command Guidance

# Lessons EIA Work

- **Strategy** - joined-up with C2 (in service considerations)
- **Command & Control input** - early input crucial
- **Disclosure** - plan for it (FOI)
- **OGDs** - synergy
- **“Precautionary approach** - risk based
- **Independent assessment** - lessons learnt
- **Legal issues** - risk of litigation
- **National + international issues** - keep informed + inform

# Lessons Approvals

- **Doubters** - deal with issues head-on ( e.g. Information note)
- **Early briefing** - (approval - 12 months)
- **Oral briefing** - insist all levels
- **Briefing** + brief + brief again !

# Lessons Presentation

- **Timing** - is everything
- **Stakeholders** - keep involved
- **Media** - may need training
- **Public** - perception that counts
- **NGOS** - go To them, manage expectations
- **Joined-up** - sort out lead and support roles

# Lessons Presentation

- **Resources/skills** - hi' workload, specialist
- **Keeping ahead of The game** - think “next race”, “next season”
- **Expect The unexpected** - risk management
- **Press office** - don't leave them alone

# Lessons Operations

- **International issues** - trans-boundary
- **National issues** - e.g. “Scottish waters”
- **Local issues** - need history
- **Management** - risk centered, platform based
- **Joined-up** - other operations before, during, after
- **Skills** - buy-in, training
- **Records** - guilty ‘til proven innocent