Input paper for the Arctic Engineering Workshop

‘the challenge of providing aton services in polar regions’

Proposed Topics for Inclusion in a Guideline on Design, Construction and Maintenance of AtoN in Cold Regions

1. Introduction
   1. Special features of AtoN in cold regions
2. Project Management Specifics
   1. Special features of project management in remote regions
   2. Considerations for scheduling work in cold regions
      1. Working on Permafrost
      2. Transportation during winter season
   3. Communication with the site during construction
   4. Quality control
   5. Safety management
      1. Safety plan
      2. Medical evacuation
3. Project Planning
   1. Planning
      1. Life Cycle Planning
      2. Requirements study
         1. type of service that would meet the requirements
         2. redundancy requirements
      3. Site selection
         1. Leading Lines (lighted or unlighted)
         2. Lighted or unlighted sites
         3. Passive AtoN (Visual, Radar)
         4. AIS
   2. Environmental assessment and mitigation measures
   3. Studies
      1. Soil surveys
      2. Land surveys
      3. Environmental conditions
      4. Ice conditions
      5. Accessibility
   4. Maintenance plans
      1. Monitoring , measuring and control
         1. Equipment
         2. Transmission of information
      2. Repair strategies
         1. In-house
         2. Contract
      3. Preventive maintenance
      4. Corrective maintenance strategies
         1. Repair by replacement
         2. Field repair
         3. Other
      5. Spare parts management
   5. Mobilization/demobilization
      1. Heavy Equipment
      2. Personnel accommodation
      3. Logistics
         1. Personnel Transportation
         2. Material Shipping
         3. Material storage
         4. Availability of manpower
         5. Selection and availability of equipment
4. Design
   1. Foundations
   2. Structures
   3. Power systems
      1. Energy generation options
         1. Solar
         2. Wind
         3. Fuel cells
         4. Primary batteries
         5. Hybrid systems
      2. Energy storage
   4. Lights
      1. Power consumption
      2. Transmissivity
      3. Low temperature performance
         1. Durability
         2. Ice build-up on lanterns
      4. Maintainability at low temperatures
   5. RACONS
      1. performance at low temperature
      2. Durability
      3. Power consumption
   6. AIS-AtoN
      1. power consumption
      2. durability of equipment
      3. performance at low temperatures
   7. On-demand AtoN
      1. AIS triggered AtoN
      2. VHF triggered AtoN
      3. Equipment specification and procurement
   8. Radar reflectors
      1. Durability
      2. Ice effect
   9. Physical protection devices
      1. Vandalism/theft
      2. animals
5. Installation / Construction
6. Reference
   1. Manuals on construction in cold regions
   2. Applicable IALA Guidelines and Recommendations