Risk

Analysis of Station Keeping Incident Data

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MTS DP Conference – Oct 2006
Analysis of Station Keeping Incident Data

• Station keeping incident data
  – Reports prepared by the vessel after a “Loss of Position” event.
  – Observed wide range of scope and depth of DP Incident reports.

• The purpose of analysis of the DP incident data:
  – Improve equipment, procedures and training.
  – Make better design choices for new vessels.
  – Increase awareness of developing trends.
Petrobras

- Database is proprietary.

- Analysis of the database is used to help avoid repetition of incidents
  - improve reliability of existing vessels
  - improve *new contract* bid specifications.
Incident Analysis Organizations

Marine Technology Society DP Committee

- DP Incident Database
  - On website
  - Voluntary
  - Anonymous
  - Open to the public for
    - submittal of reports
    - data access
Incident Analysis Organizations

International Marine Contractors Association (IMCA)

- Trade association for offshore, marine and underwater engineering companies.
- 330 plus member companies worldwide.
- Major divisions
  - Diving
  - Marine
  - Remote controlled systems, including ROV’s
  - Offshore survey
- The Marine Division is active in analysis of DP Incident reports
  - They have produced a Annual DP Incident Analysis report each year since 1990
  - Recent publication of a Ten-Year DP Incident Analysis report
IMCA DP Incident process

- IMCA invites submittal of DP incident reports
  - Members and non-members can submit - voluntary
  - DP incident reports are proprietary to IMCA

- Annual DP Incident analysis report
  - Report is available to members and the public
  - Incident Report data is anonymized
  - Includes
    - Analysis of trends of triggers
    - Analysis of incident triggers
    - Incident trees for each incident report received
Ten Year Incident Analysis

- IMCA Analysis of Station Keeping Incident Data 1994-2003
  - Ten years of data together can be more effective in revealing trends and insight into causes of DP incidents
  - More extensive scope than annual report
  - 371 Incidents were analyzed for the report
  - Incidents were categorized as
    - LOP1 is Major Loss of Position
    - LOP2 is Minor Loss of Position
LOP1 INCIDENT TRENDS - 1994 to 2003
- Initiating Event

- DP Computer
- Environment
- Power Generation
- Operator Error
- References
- Thruster
- Electrical
- TOTAL
Trends LOP2 – Minor Loss of Position

LOP2 INCIDENT TRENDS - 1994 to 2003
- Initiating Event

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LOP1 and LOP2 Trigger Comparison
Full & Partial Blackout History

- Full Blackout
- Partial Blackout

Percentage of Total

Thrusters

Thrusters - Single or Multiple

Percentage of Total

Year


Multiple Thrusters
Single Thruster

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Operator Error

Operator Error - DPO, ERO or Elec/ET

Percentage of Total

Year


Elec/ET
Other Party
ERO
DPO

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Incident Type

Incident Type - Single, Single + Hidden, Single + Operator

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Vessel Type Example

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Position Loss Difference between DP Class 2 and DP Class 3

- Data did not show that the separation required by DP Class 3 has had any influence on the type or severity of DP incidents.

- No evidence could be found to show that the back-up DP control system had been used in earnest to stop a loss of position.
Human Factors

- Human Factors
  - Poor procedures
  - Poor design
  - Insufficient test/commissioning/QA
  - Operator error

- Improved human factors could reduce or eliminate 97% of incidents
New Failure Modes

- Nearly all incidents are from well known sources of failure
- Nine new failure modes in the ten year incidents
Closing Remarks

- Participate in DP Event reporting to MTS and to IMCA
  - www.dynamic-positioning.com
  - www.imca-int.com

- My thanks to IMCA for permission to use their ten-year incident report

- The annual and ten year incident reports are available at www.imca-int.com