



## **Risk**

# **Analysis of Station Keeping Incident Data**

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*Transocean, Inc.*

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# Analysis of Station Keeping Incident Data



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# Analysis of Station Keeping Incident Data

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- **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.

# Incident Analysis Organizations

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## 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

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## 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

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## 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

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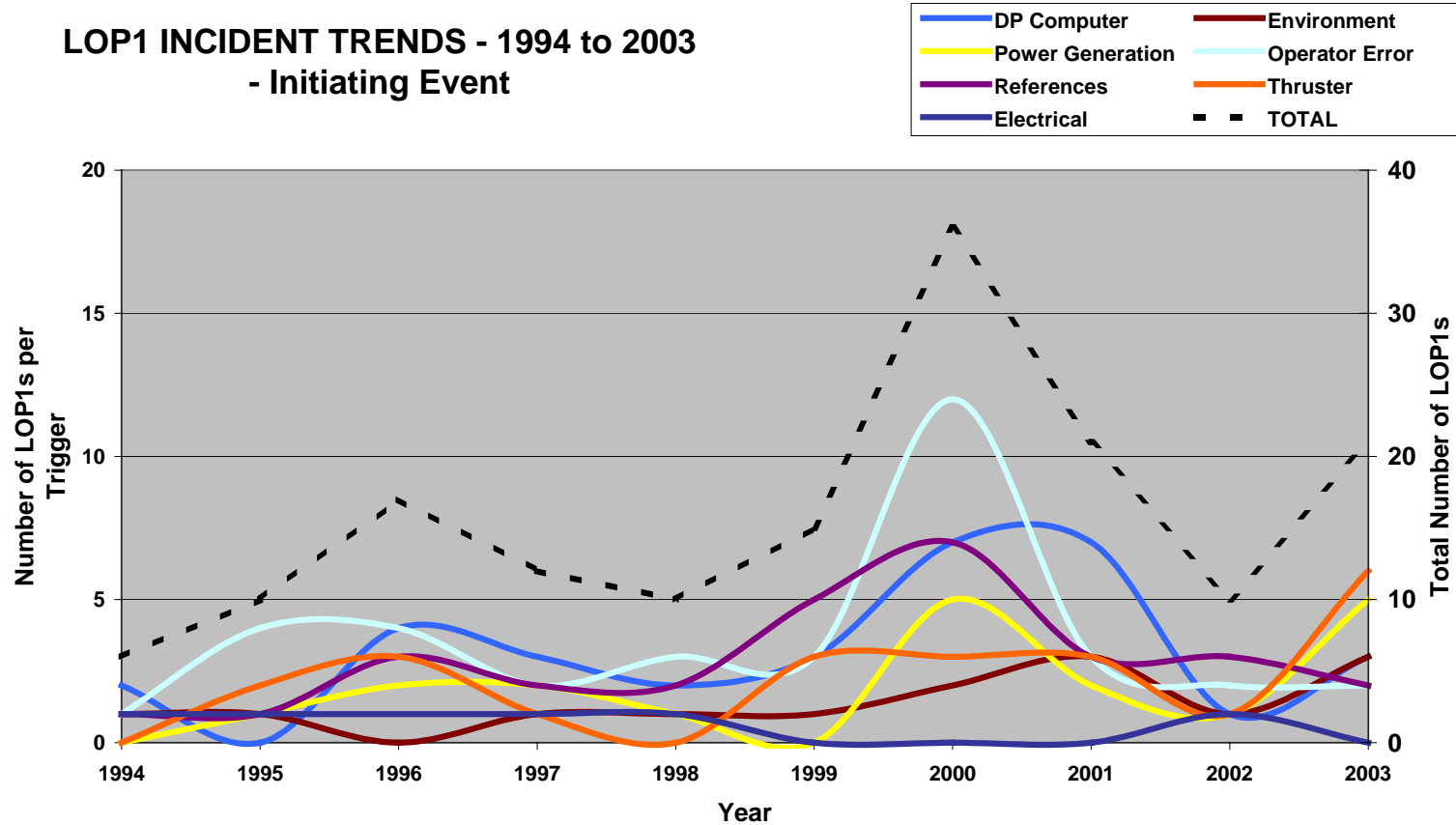
- **IMCA invites submittal of DP incident reports**
  - **Members and non-members can submit - voluntary**
  - **DP incident reports are proprietary to IMCA**
- **Annual DP Incident analysis report**
  - **Report is available to members and the public**
  - **Incident Report data is *anonymized***
  - **Includes**
    - **Analysis of trends of triggers**
    - **Analysis of incident triggers**
    - **Incident trees for each incident report received**

# Ten Year Incident Analysis

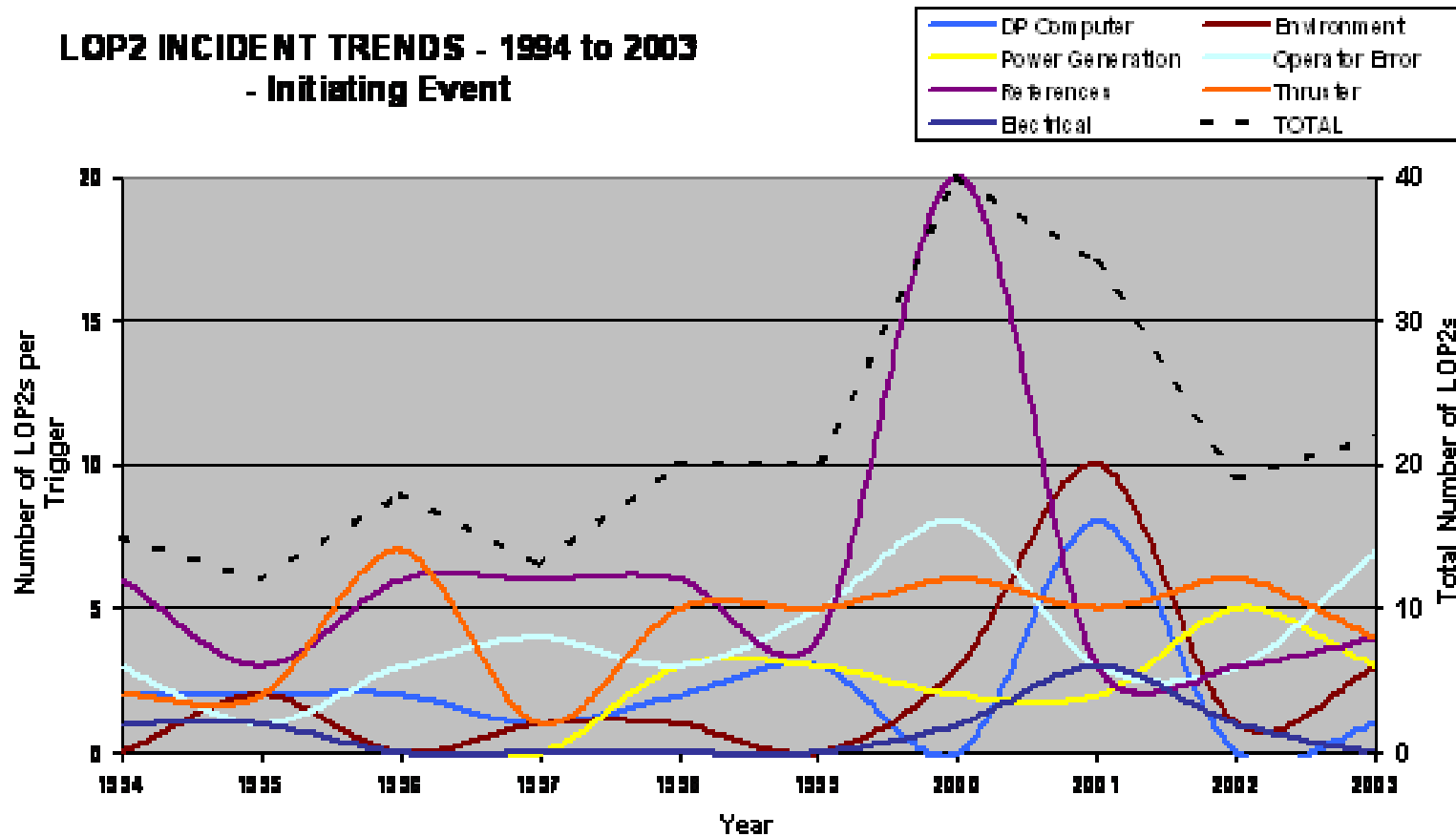
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- **IMCA Analysis of Station Keeping Incident Data 1994-2003**
  - Ten years of data together can be more effective in revealing trends and insight into causes of DP incidents
  - More extensive scope than annual report
  - 371 Incidents were analyzed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

# Trends LOP1 - Major Loss of Position

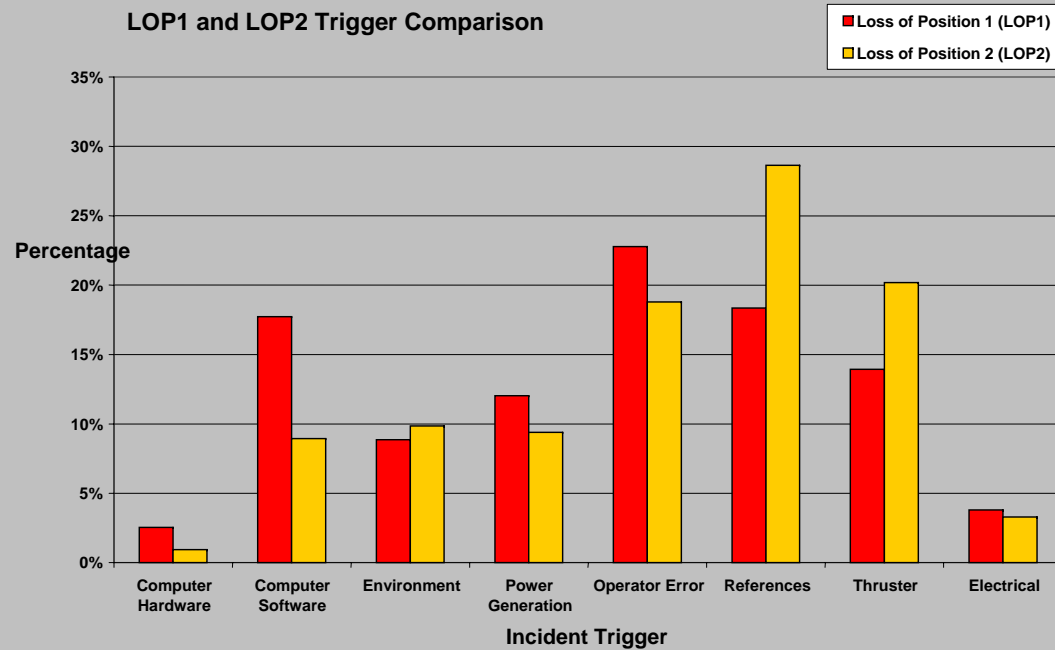


# Trends LOP2 – Minor Loss of Position

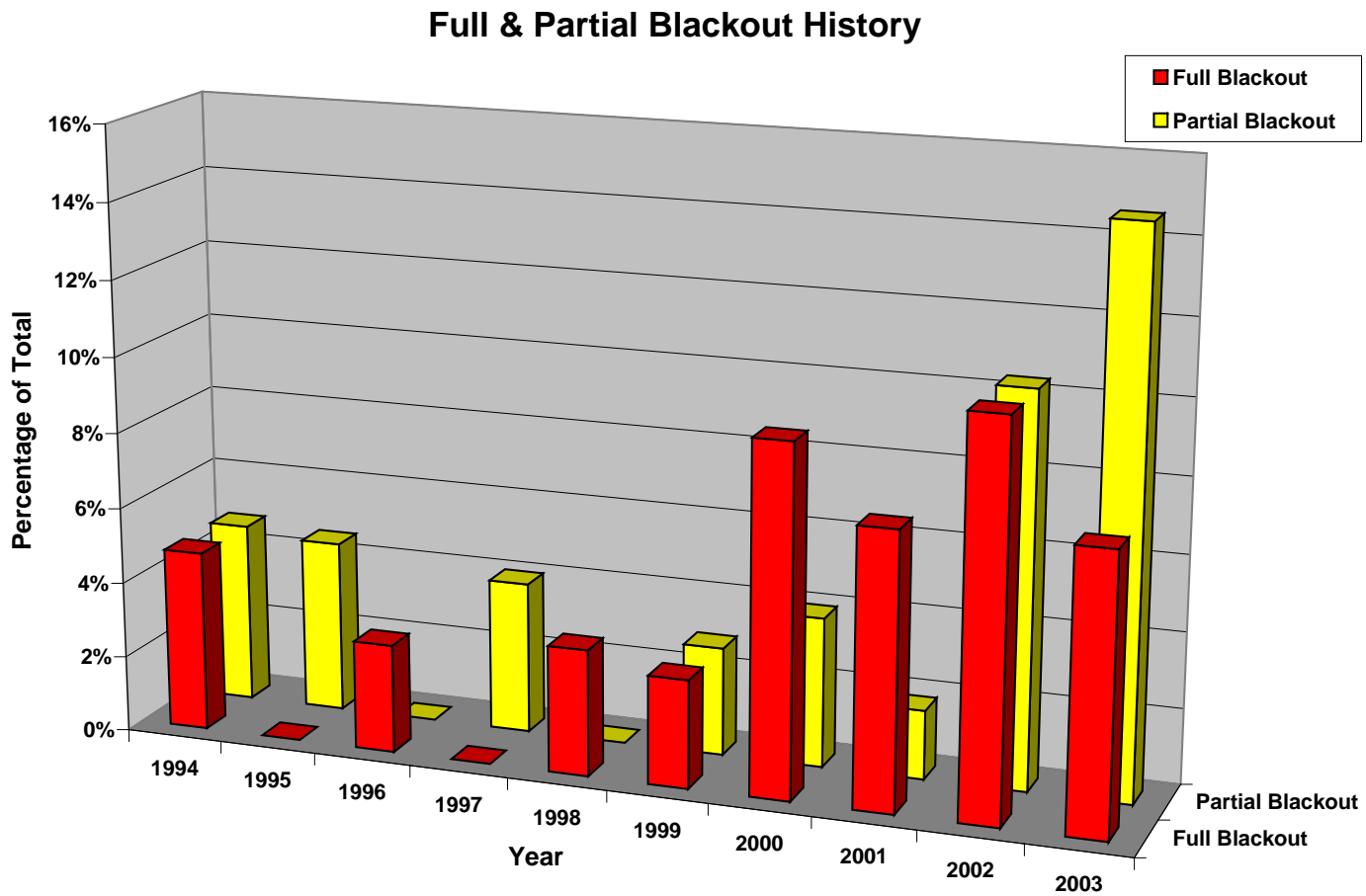


MTS DP Conference – Oct 2006

# Trigger Comparison

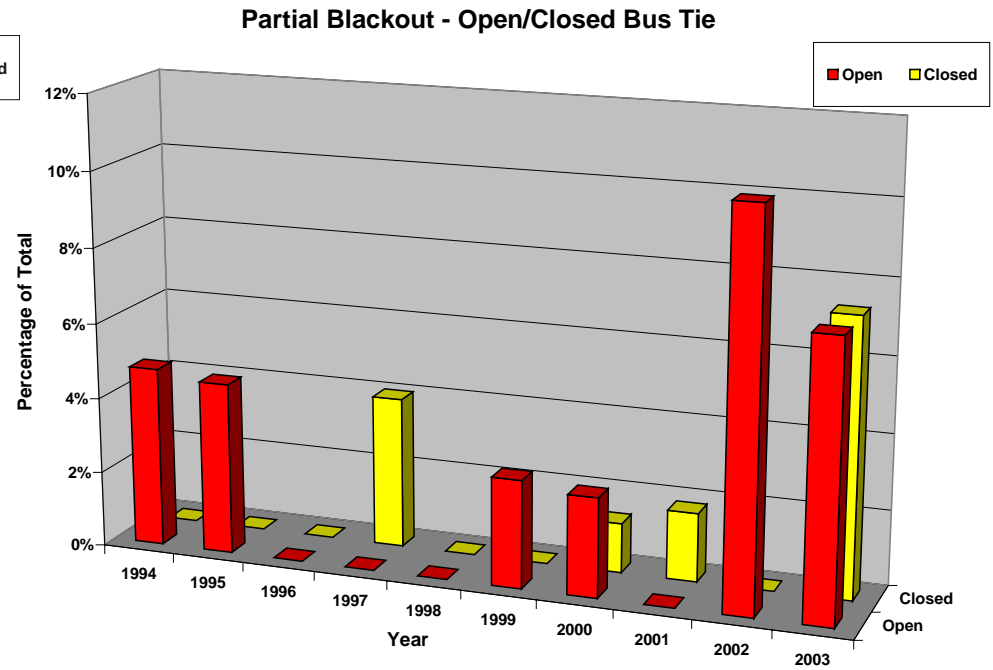
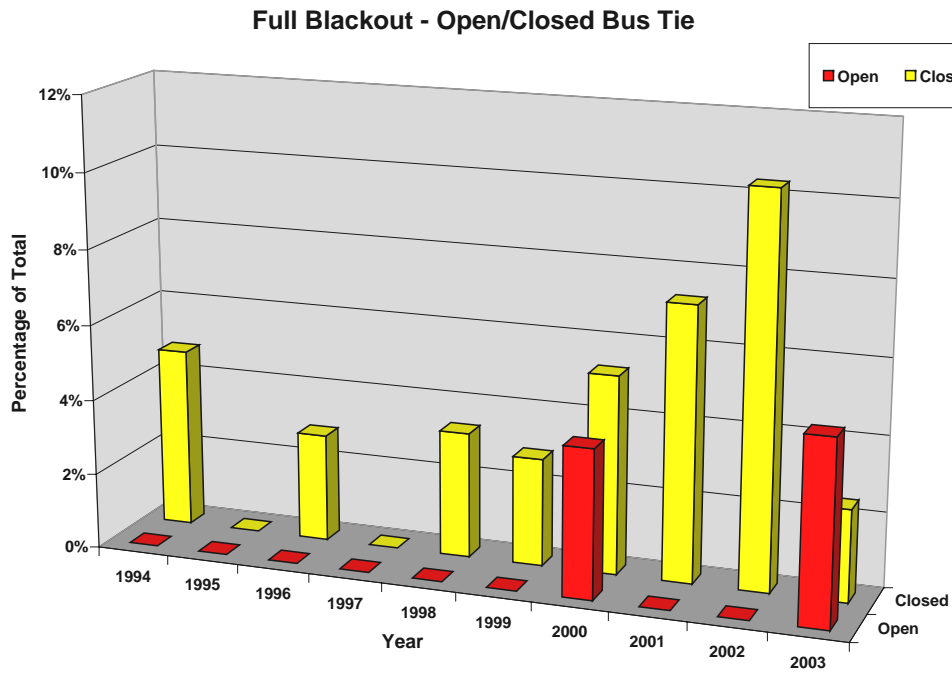


# Blackouts

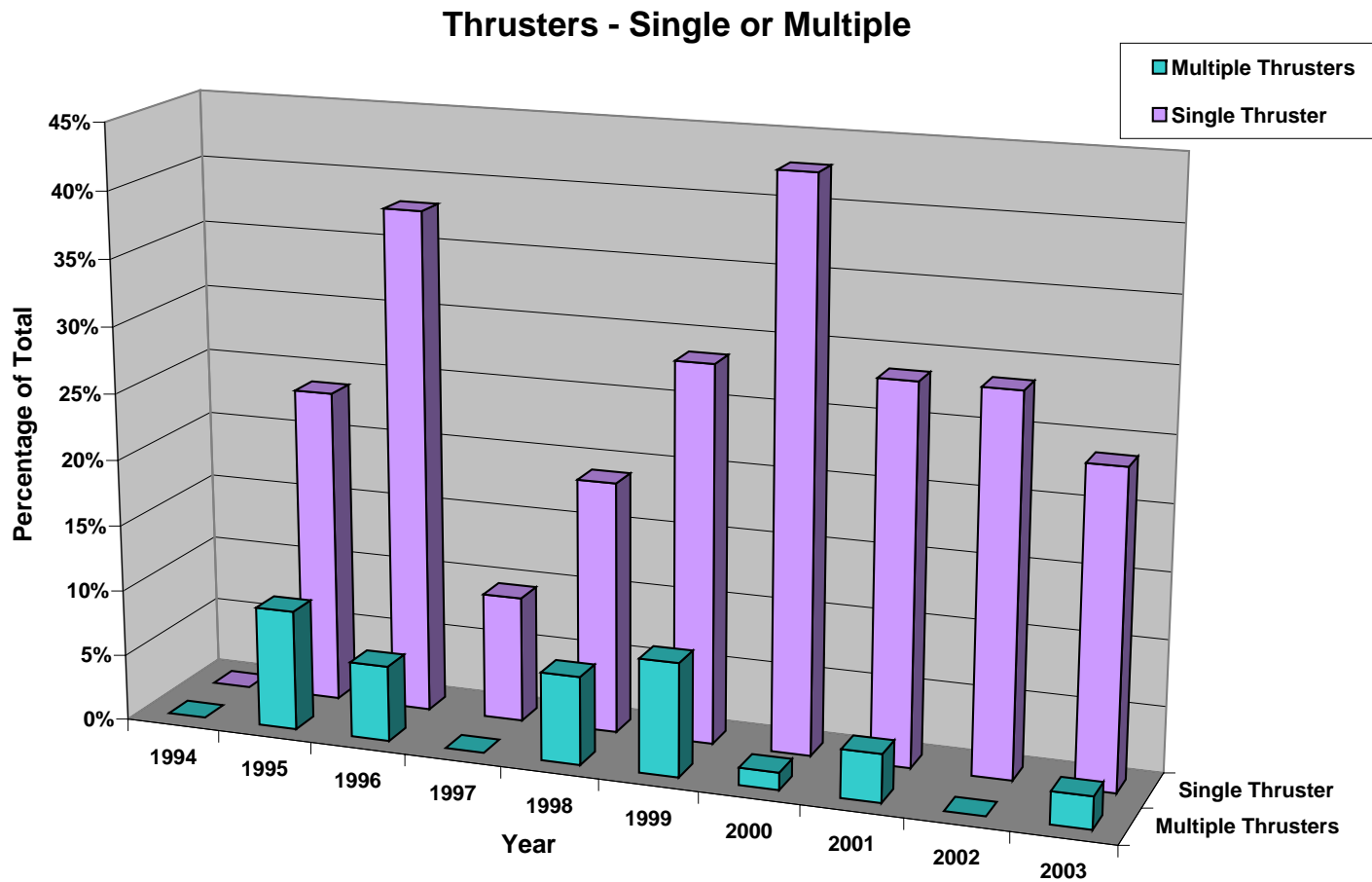


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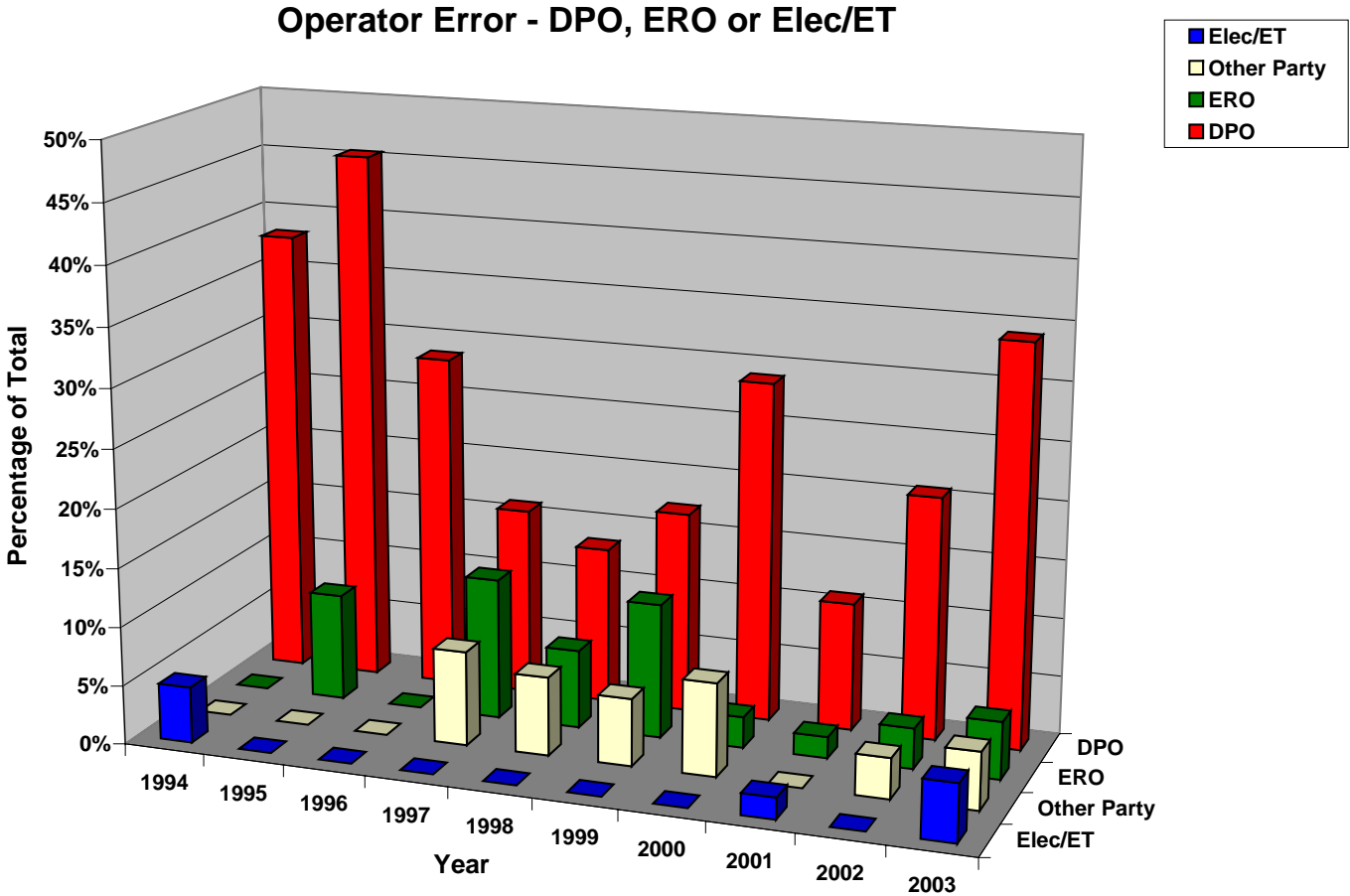
# Blackouts



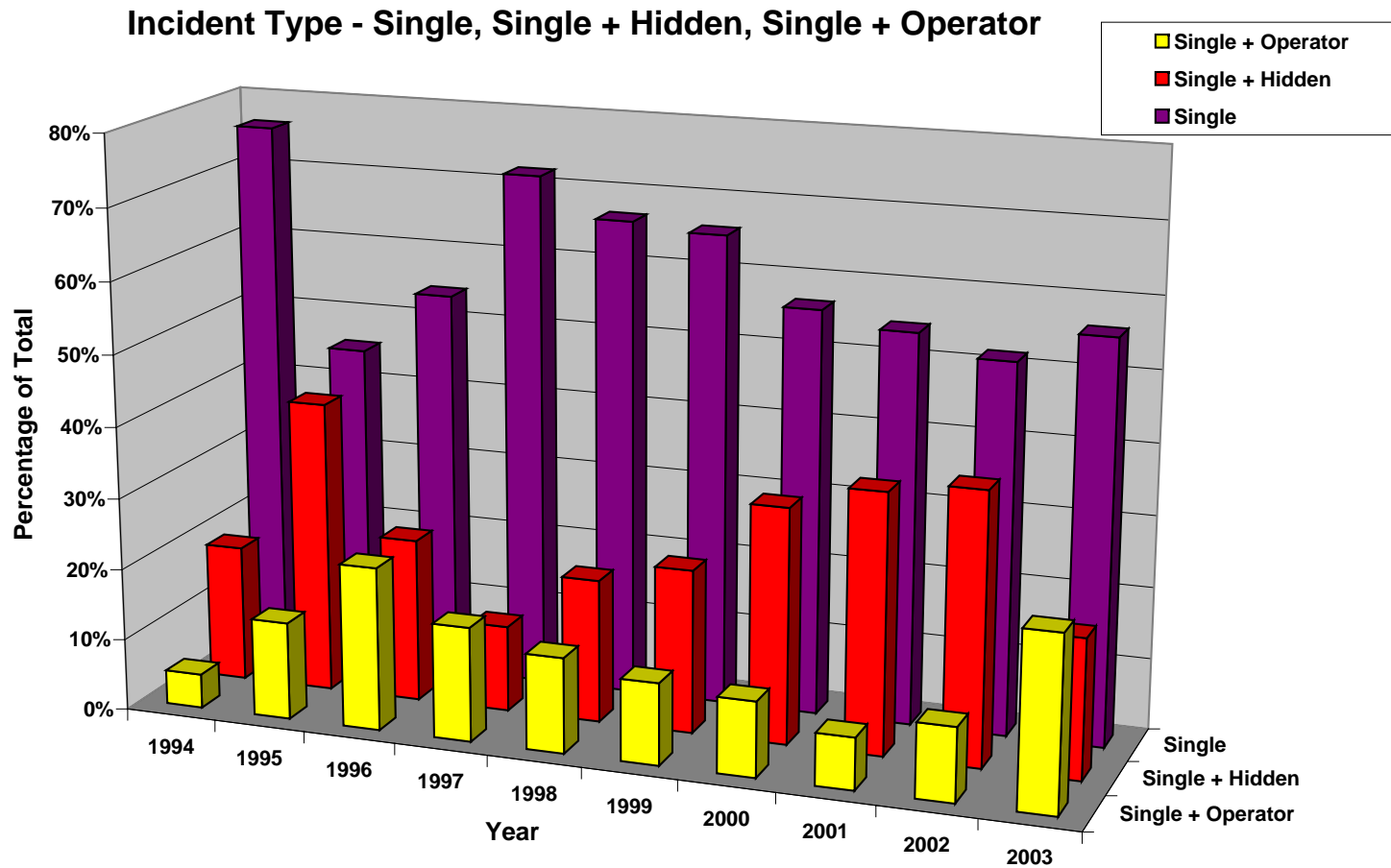
# Thrusters



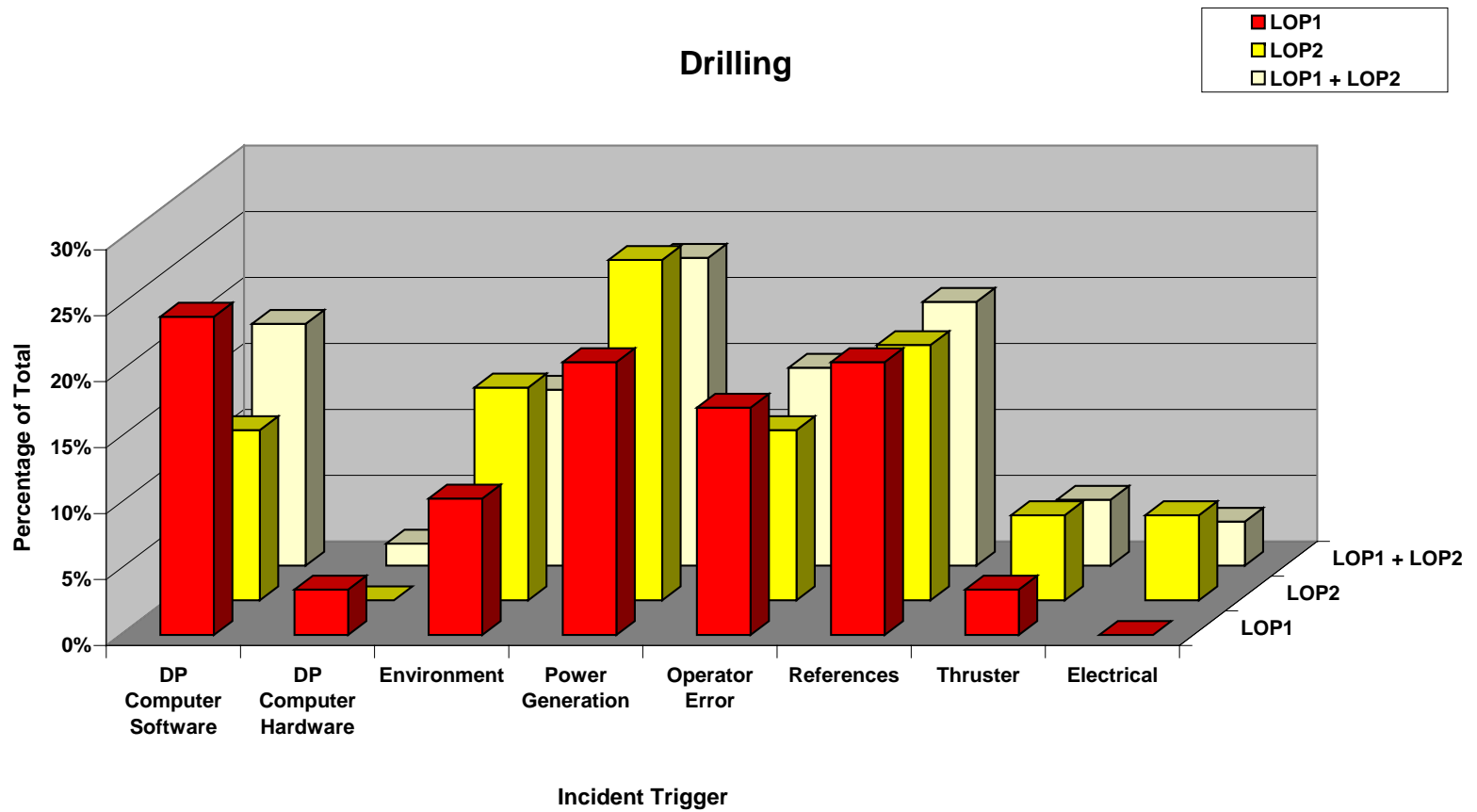
# Operator Error



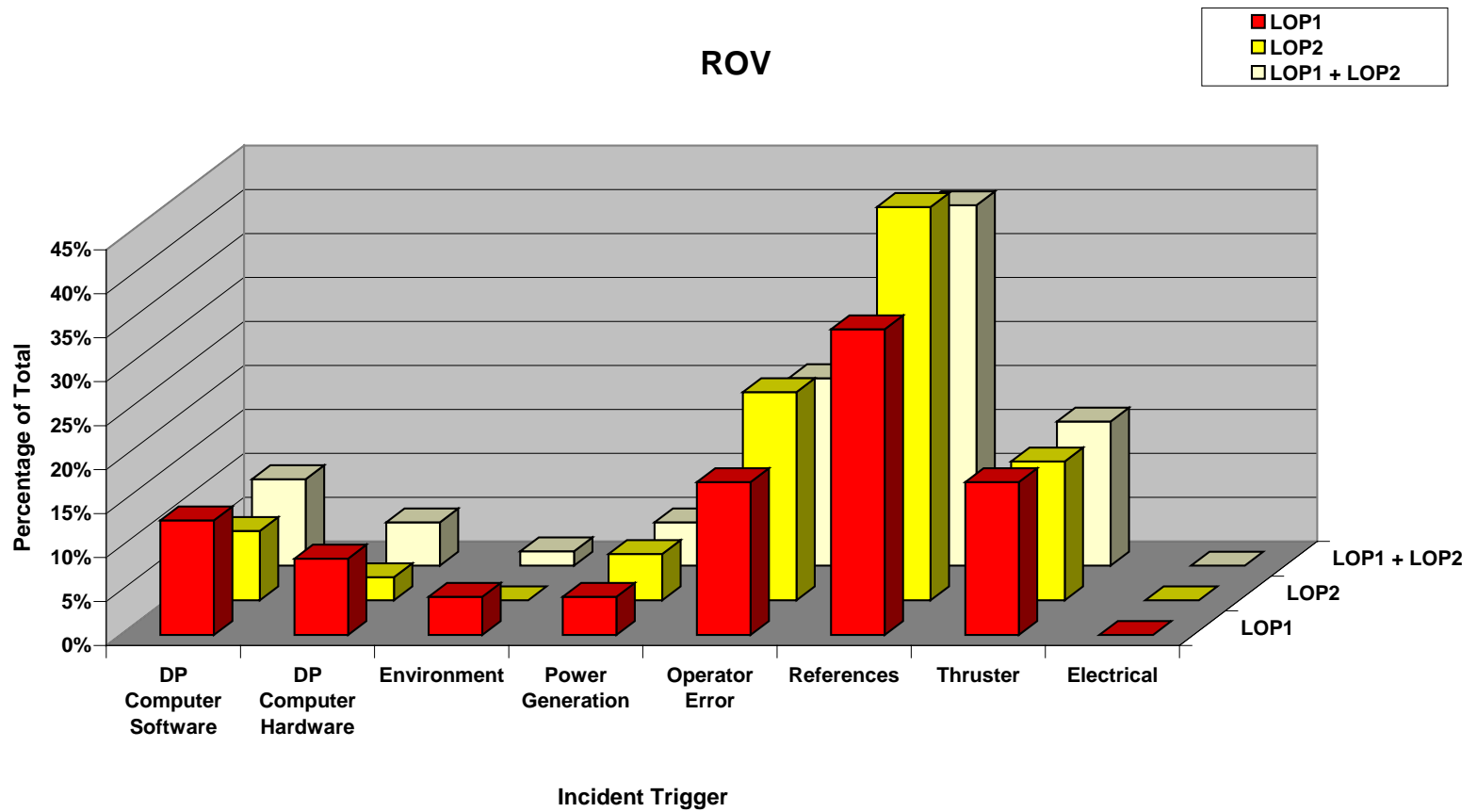
# Incident Type



# Vessel Type Example



# 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

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- **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

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

## Closing Remarks

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- Participate in DP Event reporting to MTS and to IMCA
  - [www.dynamic-positioning.com](http://www.dynamic-positioning.com)
  - [www.imca-int.com](http://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](http://www.imca-int.com)