Risk

Analysis of Station Keeping Incident Data

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MTS DP Conference – Oct 2006

Transocean

Analysis of StationKeeping 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.

Incident Analysis Organizations

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

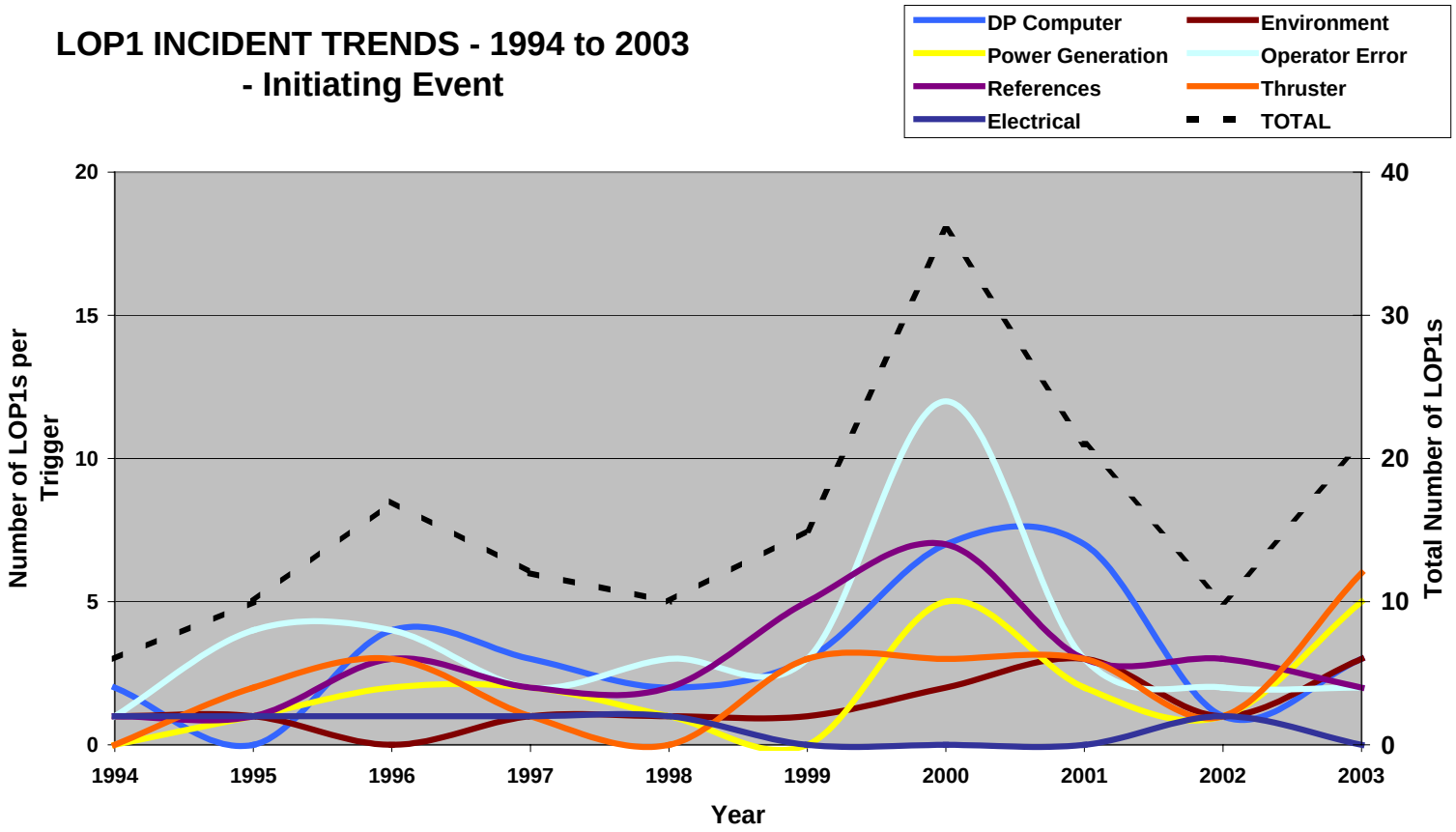
- IMCA invites submittal of DP incident reports
  - Members and non-members can submit - voluntary
  - DP incident reports are proprietary to IMCA

- 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

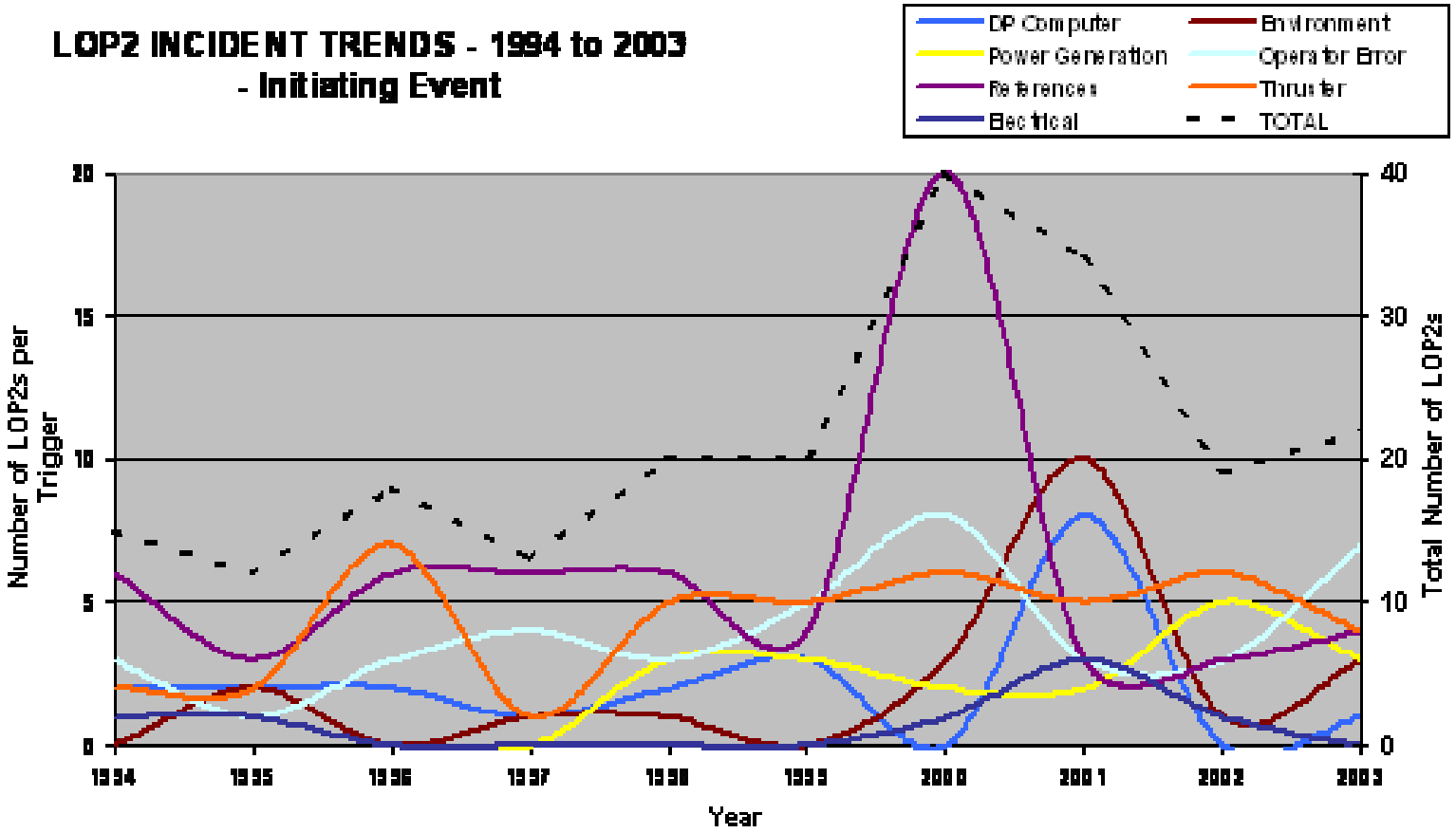
Ten Year Incident Analysis

- **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**

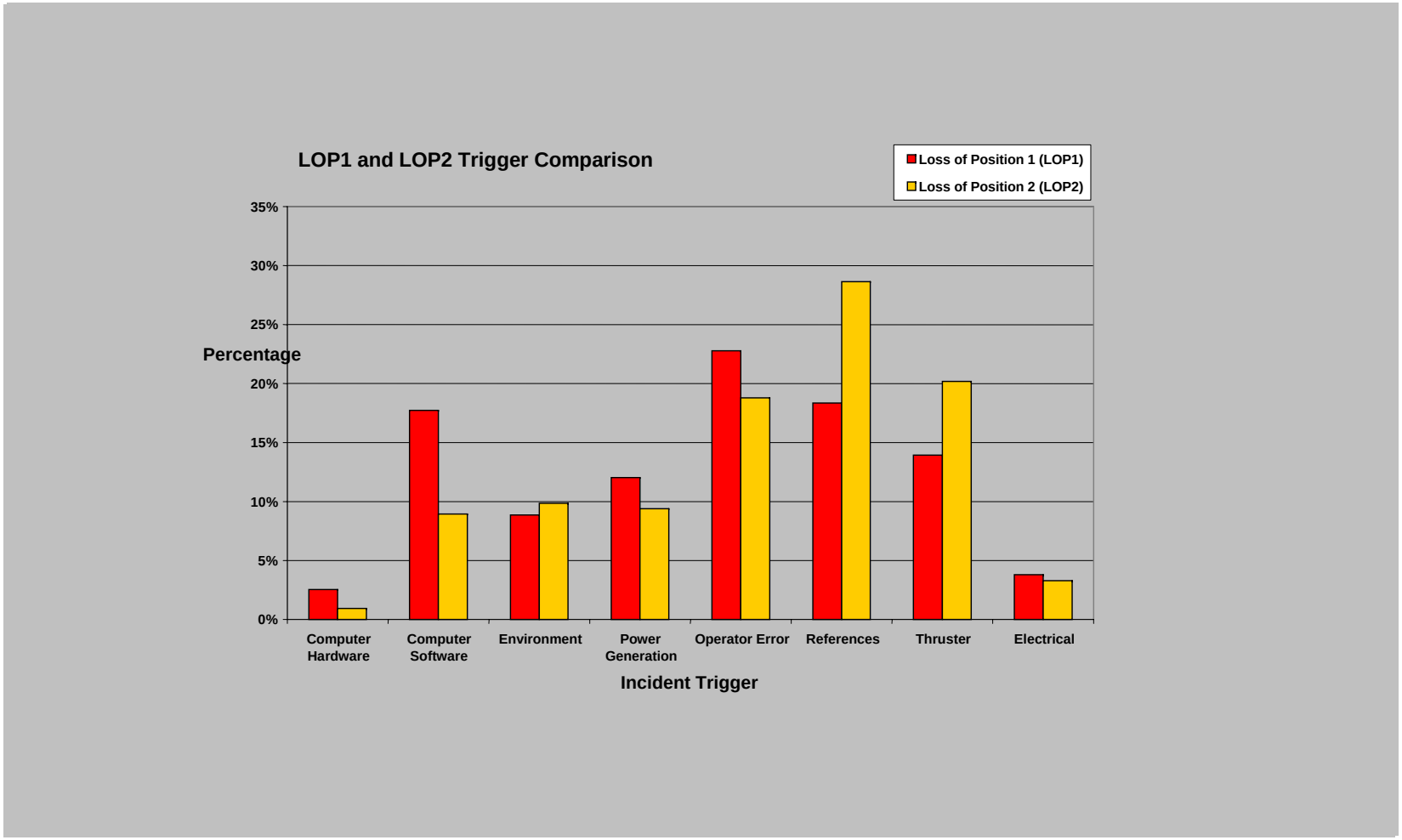
Trends LOP1 - Major Loss of Position



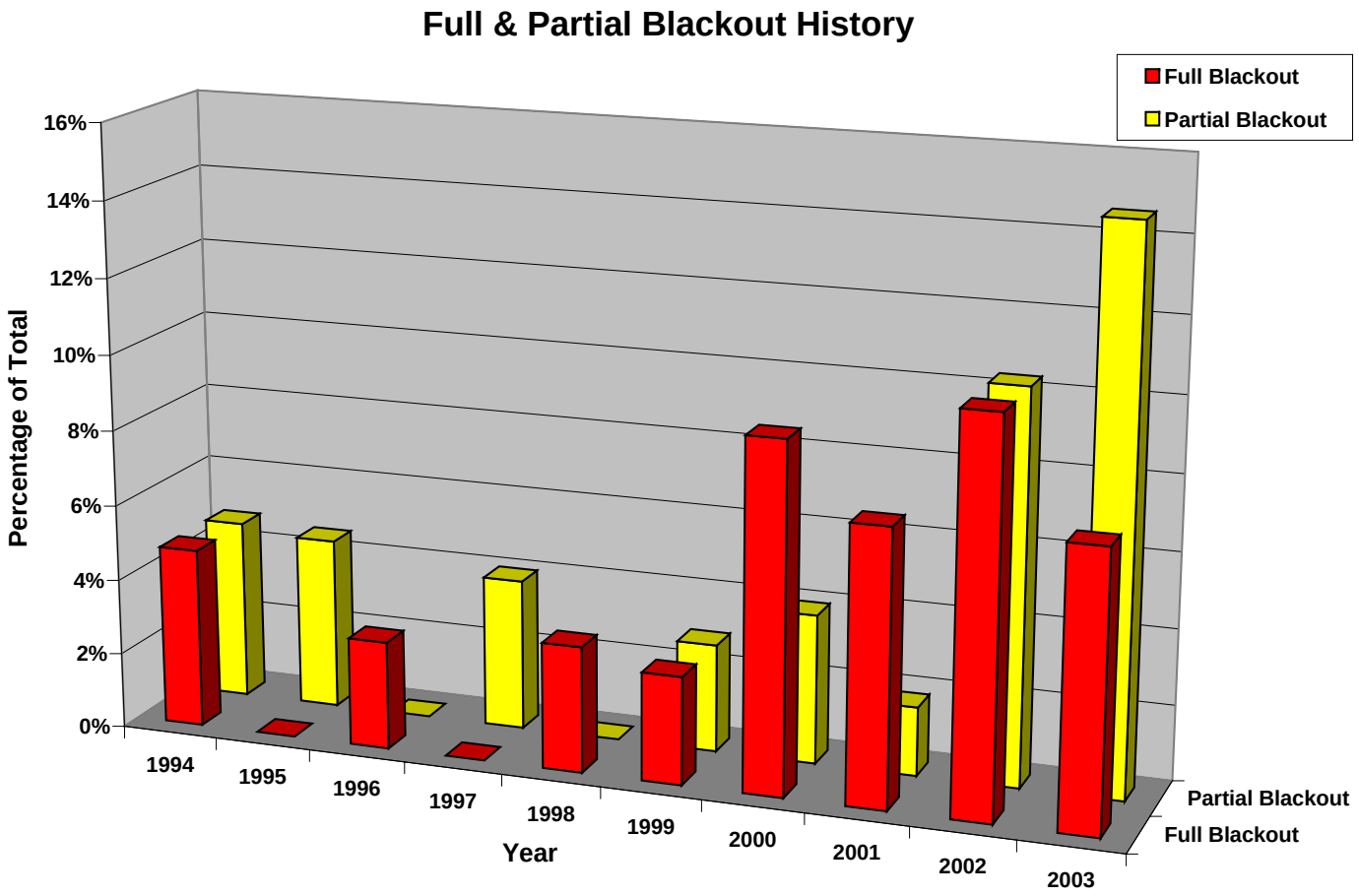
Trends LOP2 – Minor Loss of Position



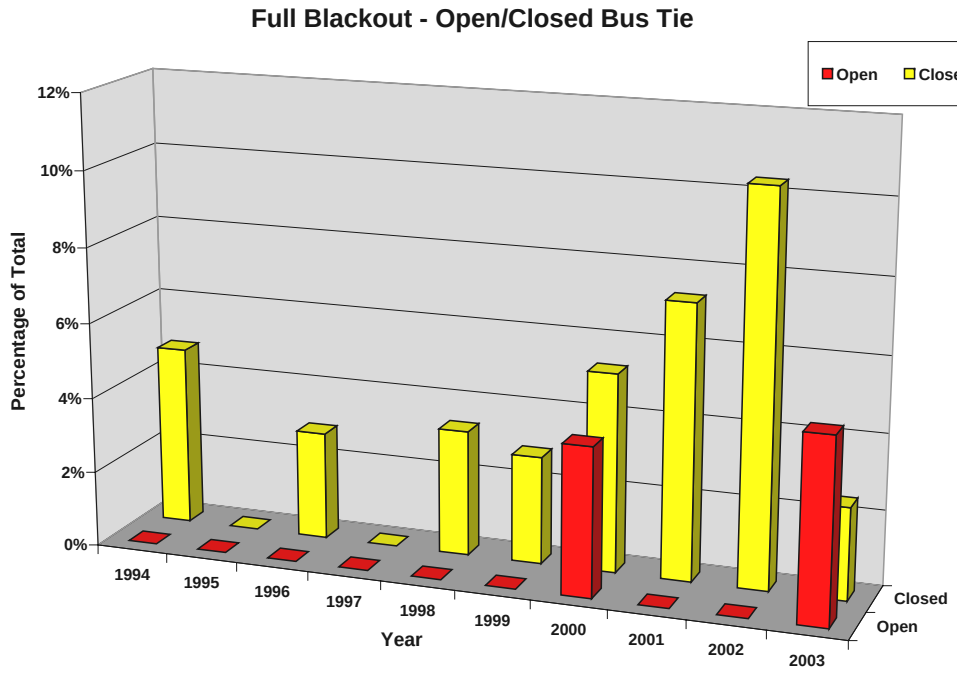
Trigger Comparison

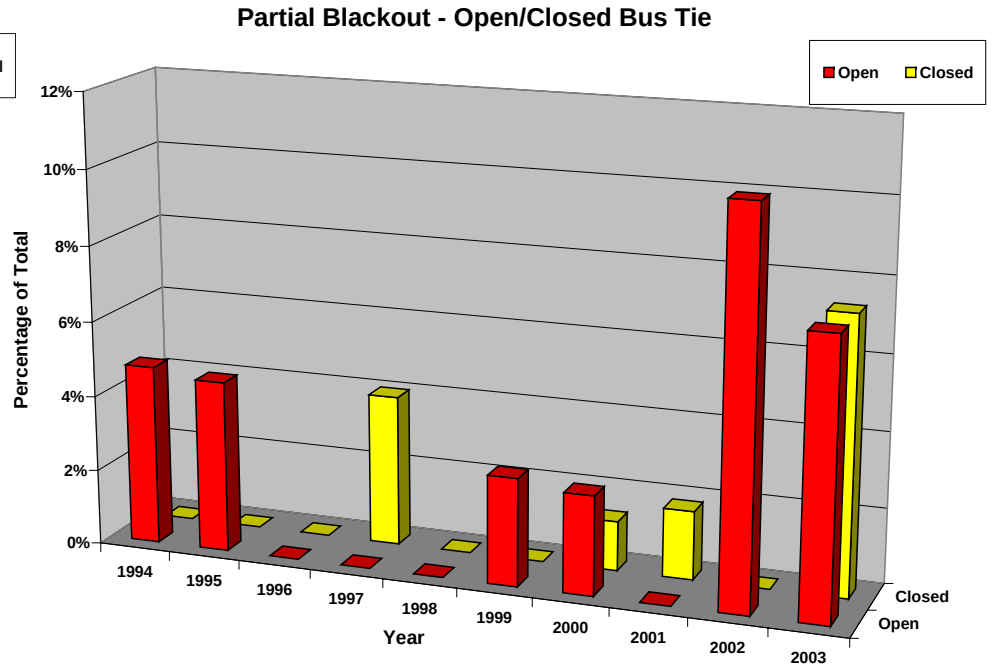


Blackouts


Full & Partial Blackout History
Full Blackout
Partial Blackout
16%
14%
12%
10%
8%
6%
4%
2%
0%
Percentage of Total
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
Year
Partial Blackout
Full Blackout

Blackouts





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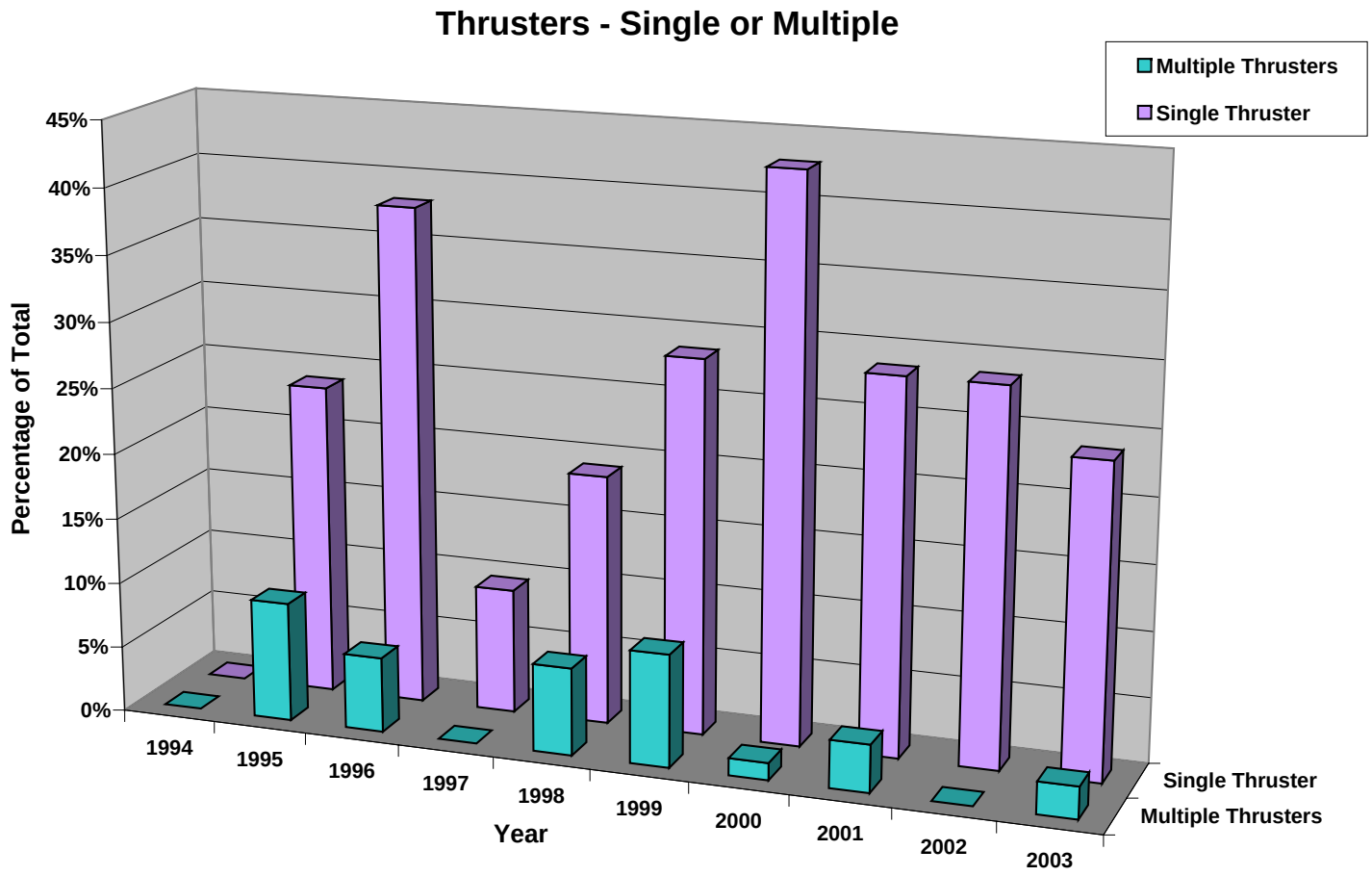
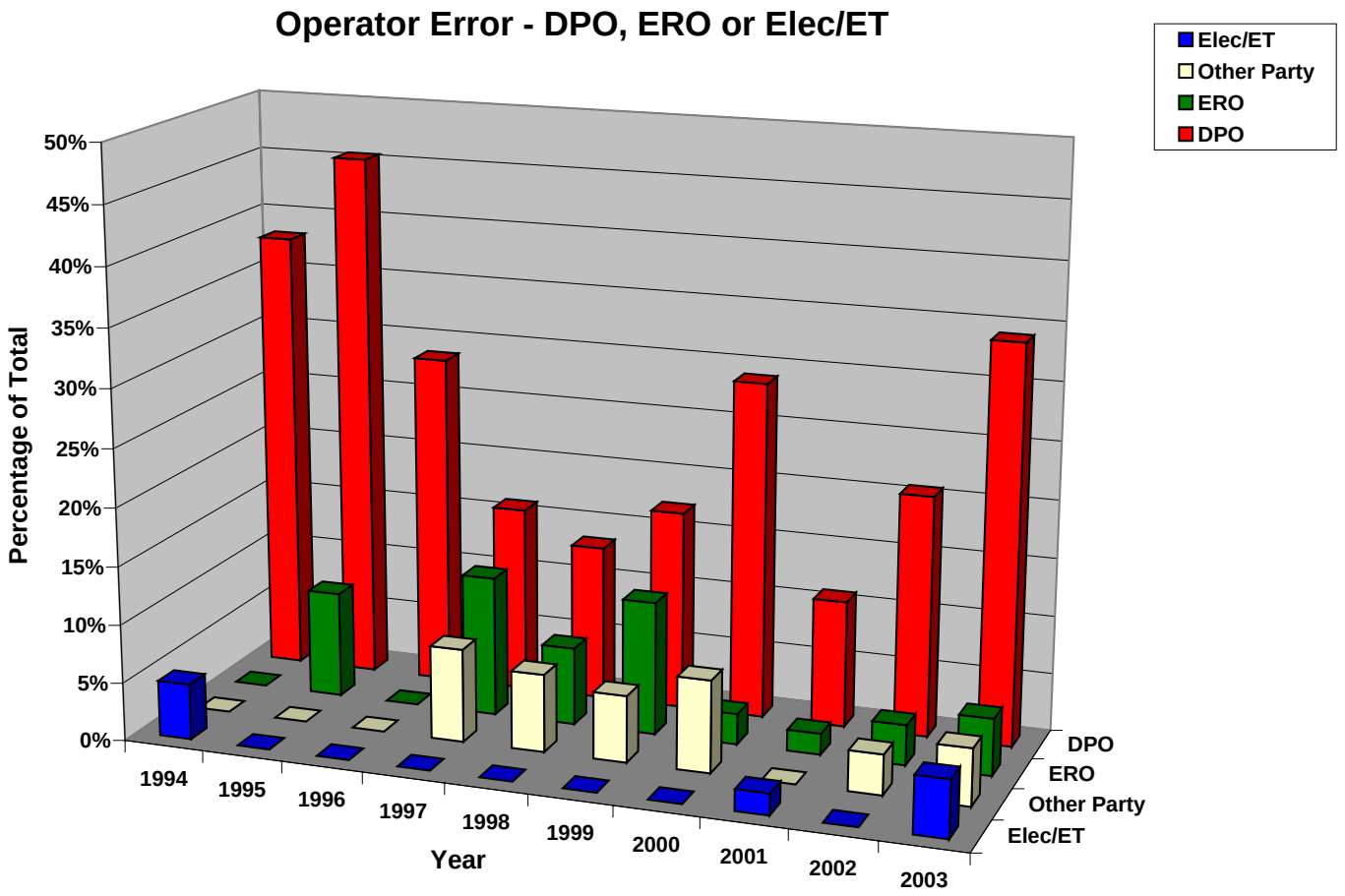
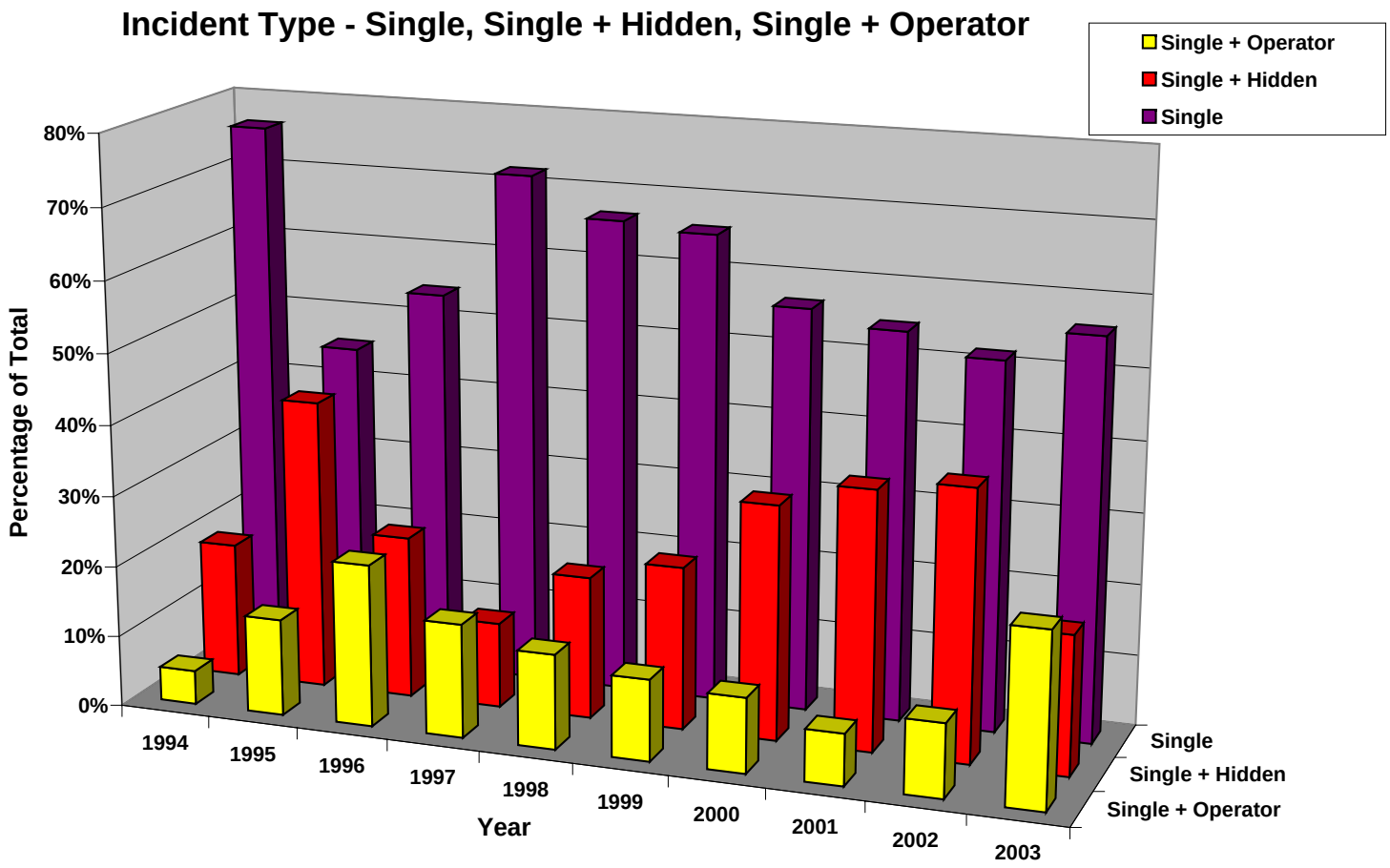
Thrusters


Thrusters - Single or Multiple
Multiple Thrusters
Single Thruster
Percentage of Total
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
Year
Single Thruster
Multiple Thrusters

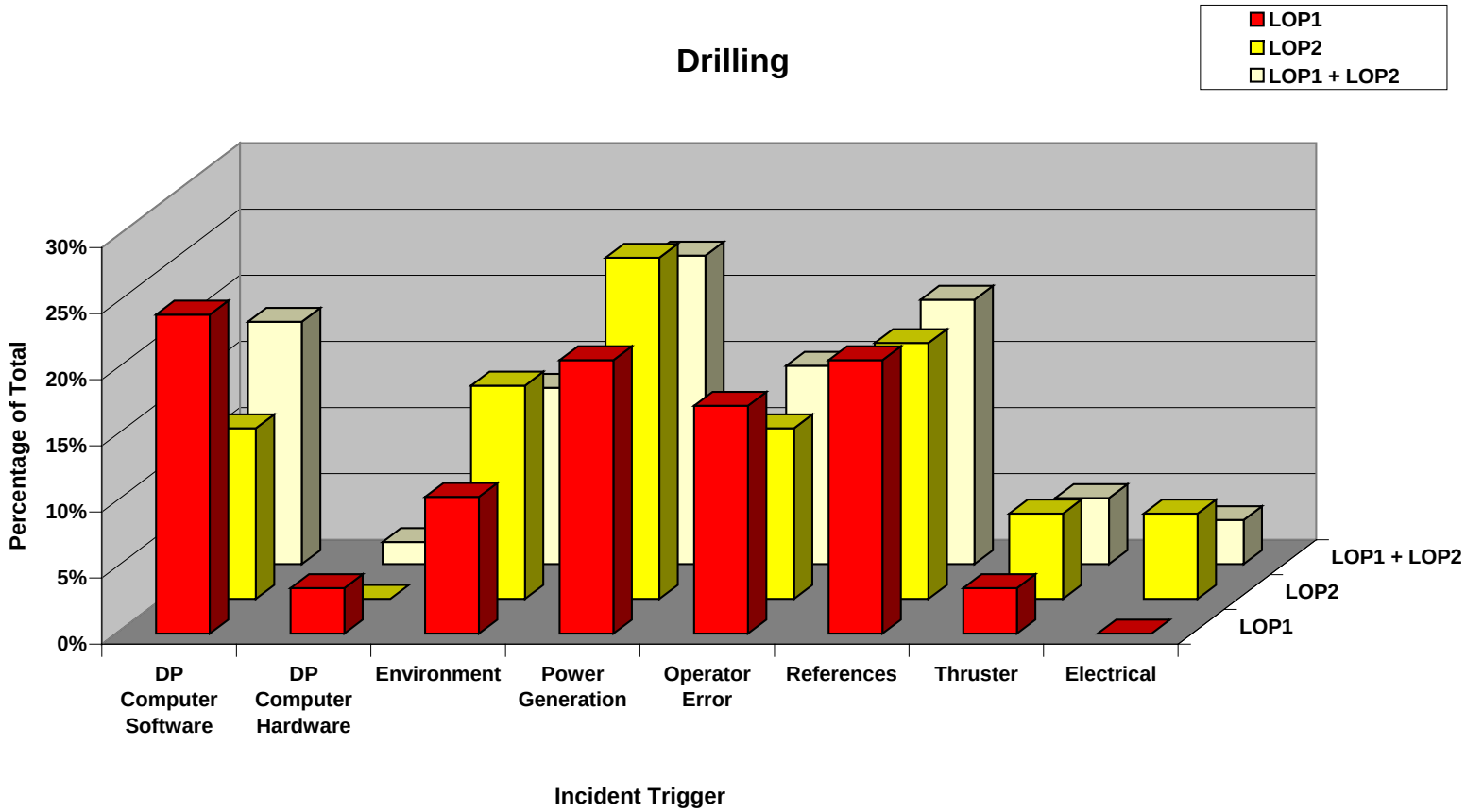
Operator Error



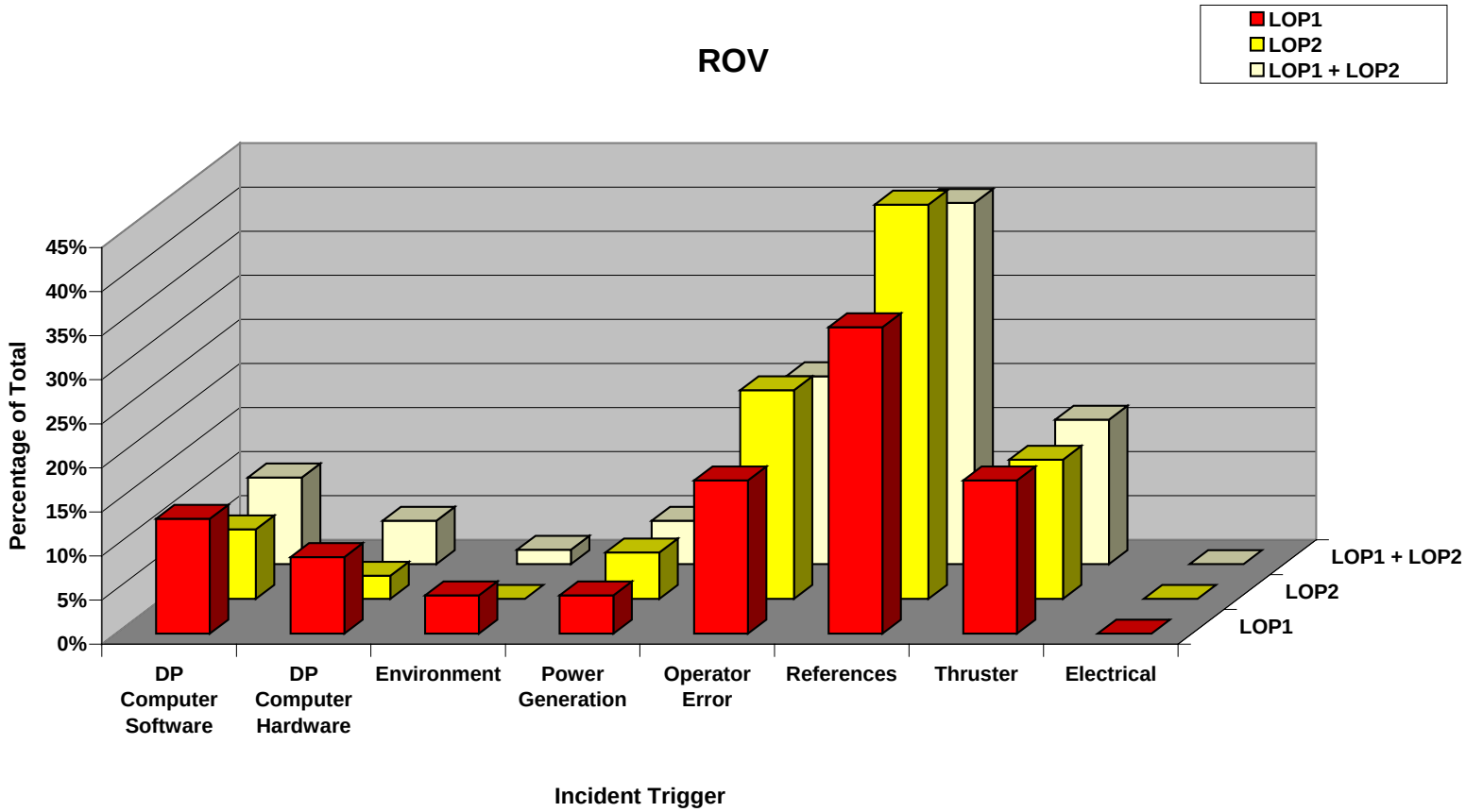
Incident Type



Vessel Type Example



Vessel Type Example



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