



Risk

Analyzing Petrobras DP Incidents

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Petrobras

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Analyzing Petrobras DP Incidents

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E&P-SERV/US-SS/CPSE



Petrobras Scenario

- 80% of the Brazilian oil and gas production is extracted from the sea.
- Different working environments - some of them specific to the Brazilian offshore fields.
- DP rigs, a successful tool used to drill, complete and carry out workovers in sub sea wells.

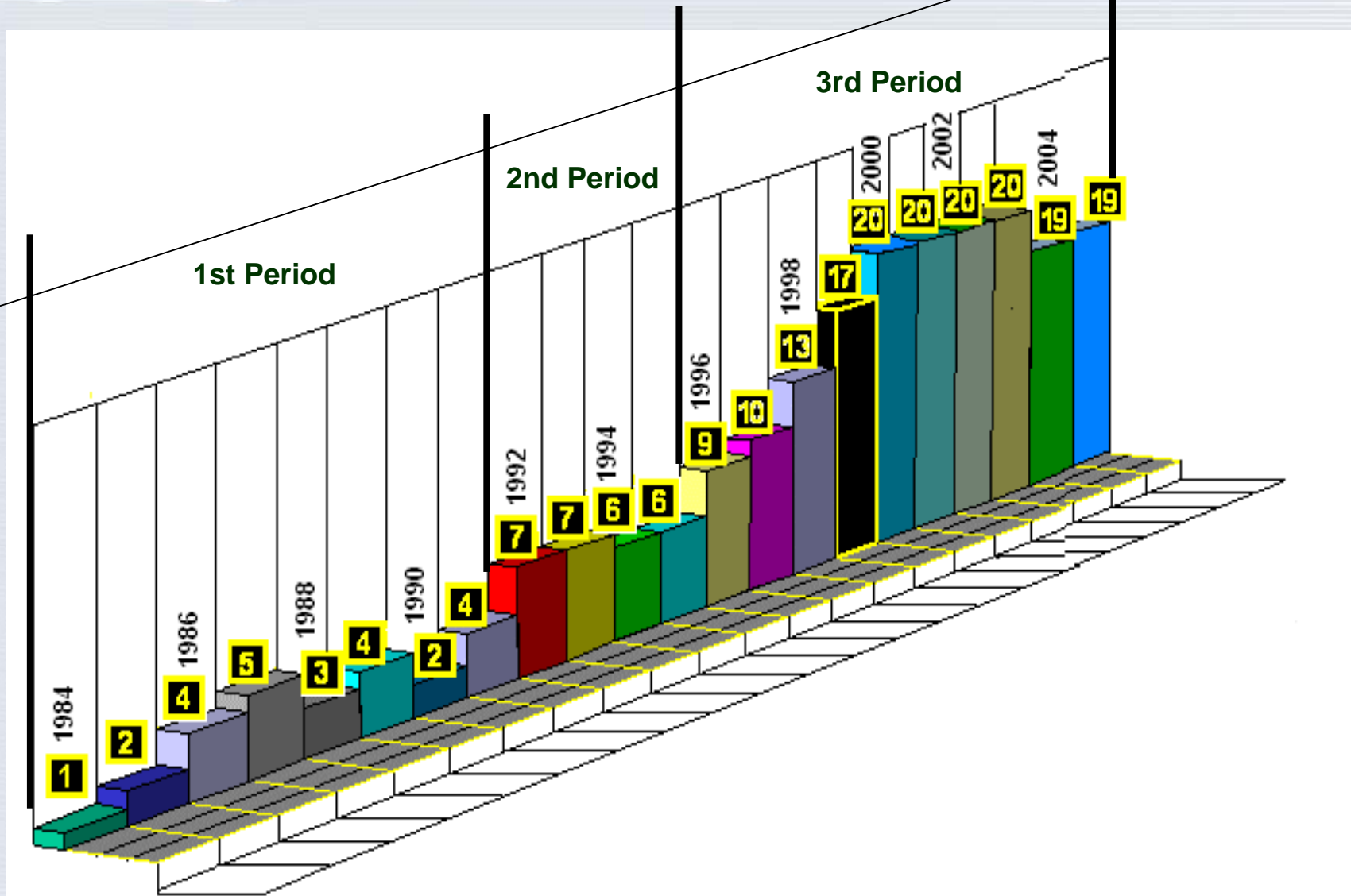


- Situation before 1992:
 - ✓ Poor operational procedures and lack of contingency plans;
 - ✓ Inappropriate operational safety limits;
 - ✓ Engineers were unfamiliar with DP rigs details.
- Petrobras started carrying out DP vessel studies.
- 1992 => DPSS (Dynamic Positioning Safety Program) is created in partnership with contractors - to avoid incidents or, at least, to minimize their consequences by using a proactive policy.
- 1996 => The number of DP vessels started increasing rapidly.



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DP Vessels Operating for Petrobras





Projects being developed by DPPS

- 01** - Weather Forecasts
- 02** - DP Incidents Data Bank (BDIP)
- 03** - Restrictions Diagram
- 04** - Procedure Prior to Arrival on Location
- 05** - Position Reference System
- 06** - EDS and Degraded Status Criteria
- 07** - Contingency Plans for Uncontrolled Drift (blackout situation)
- 08** - DP Rig Audit
- 09** - Non-conformities Data Bank (SPS)
- 10** - Bid Requirements
- 11** - Key DP Personnel Log Book
- 12** - DP Training for Petrobras Representative on board
- 13** - New Projects



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02 - DP Incidents Data Bank (BDIP)



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Objectives:

- to avoid repeating occurrences - an useful and practical tool to improve reliability on DP Vessels;
- to keep an updated source for contracts renewals and
- for DPPS risk management purposes.

[Produção] - - BACIA DE CAMPOS

Arquivo Editar Exibir Favoritos Ferramentas Ajuda

Endereço <http://www.ep-serv.petrobras.com.br/aplicativo/E6IU-RIDP/aplic/default.asp> Ir Links

Registro de Incidentes

- Menu
- + Cadastros
- + Estatísticas
- Consulta RIDP
- RIDP
- Help

BDIP

Banco de Dados de Incidentes em Posicionamento Dinâmico

Concluído Local intranet

Iniciar Microsoft PowerPoint ... [Produção] - - BACIA ... Desktop 15:10

RIDP

BLOCO 01

DADOS GERAIS

Sonda: Data da Ocorrência: Hora da Ocorrência: Nº Incidente no dia:

Selecionar Campo, Poço e PDA Inserir Campo, Poço e PDA manualmente

Nome do campo: Nome do poço: PDA:

Atividade: Incidente:

Tipo Operação:

SALVAR DADOS DO BLOCO 01

BLOCO 02

RESPONSABILIDADE OPERACIONAL DURANTE O INCIDENTE

BLOCO 03

ORIGEM DO INCIDENTE

BLOCO 04

INCIDENTE É QUALQUER AMEAÇA OU PERDA DE POSIÇÃO

BLOCO 05

SITUAÇÃO DA SONDA NO MOMENTO DO INCIDENTE

BLOCO 06

CONDIÇÕES AMBIENTAIS NO MOMENTO DO INCIDENTE

BLOCO 07

TEMPOS DAS ANORMALIDADES

BLOCO 08

DESCRIÇÃO SUMÁRIA DO INCIDENTE

BLOCO 09

CONSEQUÊNCIA DO INCIDENTE

BLOCO 10

AÇÕES CORRETIVAS

BLOCO 11

CAUSA BÁSICA DO INCIDENTE

BLOCO 12

RECOMENDAÇÕES, COMENTÁRIOS E ASSUNTOS NÃO ESCLARECIDOS

BLOCO 13

CUSTO ESTIMADO DO INCIDENTE EM (U\$ 1000,00)

Pesquisar

Fechar

Registro de Incidentes

- Menu
- Cadastros
- Estatísticas
- Consulta RIDP
- RIDP
- Help

FILTROS

Sonda:	<input type="text" value="Selecione"/>	Período:	<input type="text"/> a <input type="text"/>	Período no dia:	<input type="text"/> a <input type="text"/>
Nome do Campo:	<input type="text" value="Selecione uma opção"/>	Origem da Falha:	<input type="text" value="Sistema de Thruster/Propulsão"/> <input type="text" value="Selecione uma opção"/> Condições Ambientais Sistema de Geração/Distribuição Sistema de Referência de Posição Sistema de Sensores Sistema de Controle do DP Sistema de Thruster/Propulsão Falha Humana Barco de Segurança Método Alternativo de Segurança	Ponto de Falha:	<input type="text" value="Bétrico"/> <input type="text" value="I"/> <input type="text" value="E"/>
Incidente:	<input type="text" value="Selecione uma opção"/> <input type="text" value="I"/> <input type="text" value="E"/>	Atividade:		Conectada ao Poço?:	<input type="text" value="Selecione Opção"/>
Houve Blackout?:	<input type="text" value="Selecione Opção"/>	Status do RIDP:		Tempo Total da Deriva (hh:mm):	<input type="text"/> a <input type="text"/>
Afastamento (deriva):	<input type="text"/> a <input type="text"/>	Direção da Deriva (Graus):	<input type="text"/> a <input type="text"/>	Tipo Causa Básica:	<input type="text" value="Selecione uma opção"/> <input type="text" value="I"/> <input type="text" value="E"/>
Utilizado Barco de Emergência?:	<input type="text" value="Selecione Opção"/>	Custo total do Incidente:	<input type="text"/> a <input type="text"/>		
Houve Desconexão?:	<input type="text" value="Selecione Opção"/>				
Itens Seleccionados[Incidente]:	<input type="text"/>	Itens Seleccionados[Origem da Falha]:	<input type="text"/>	Itens Seleccionados[Ponto de Falha]:	<input type="text"/>
				Itens Seleccionados[Tipo Causa Básica]:	<input type="text"/>

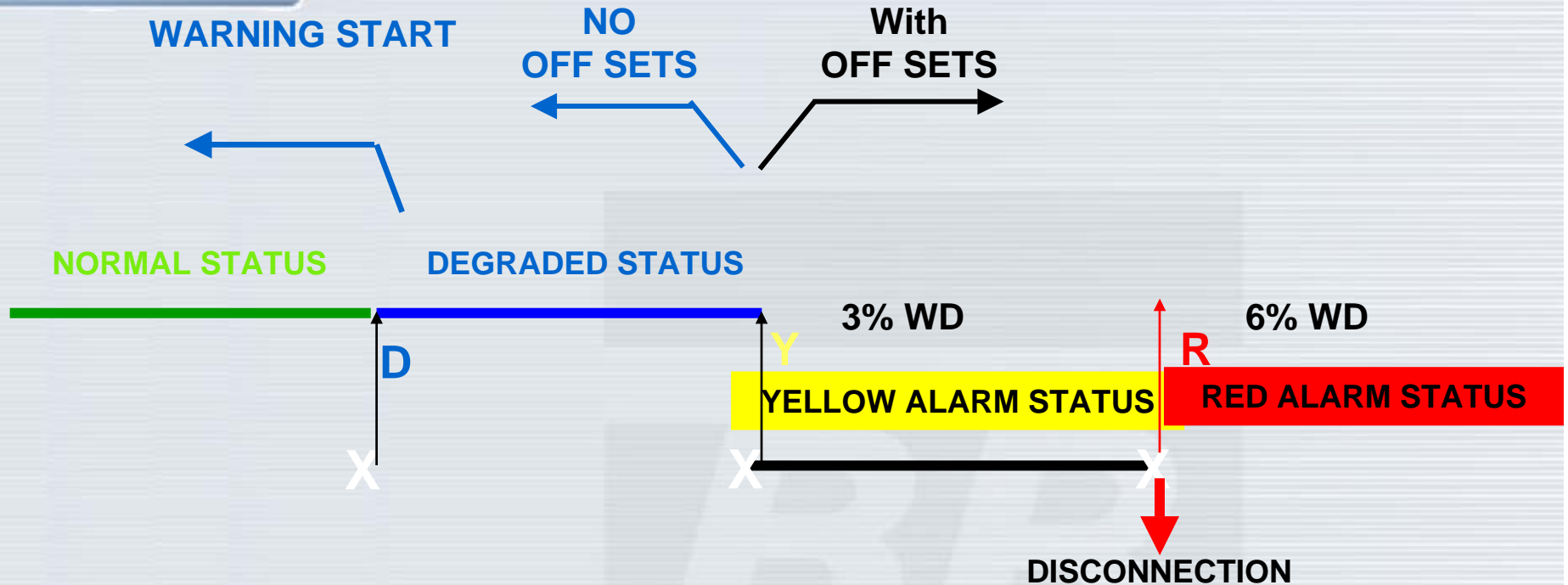
Pesquisar

Imprimir



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Definition of Incident



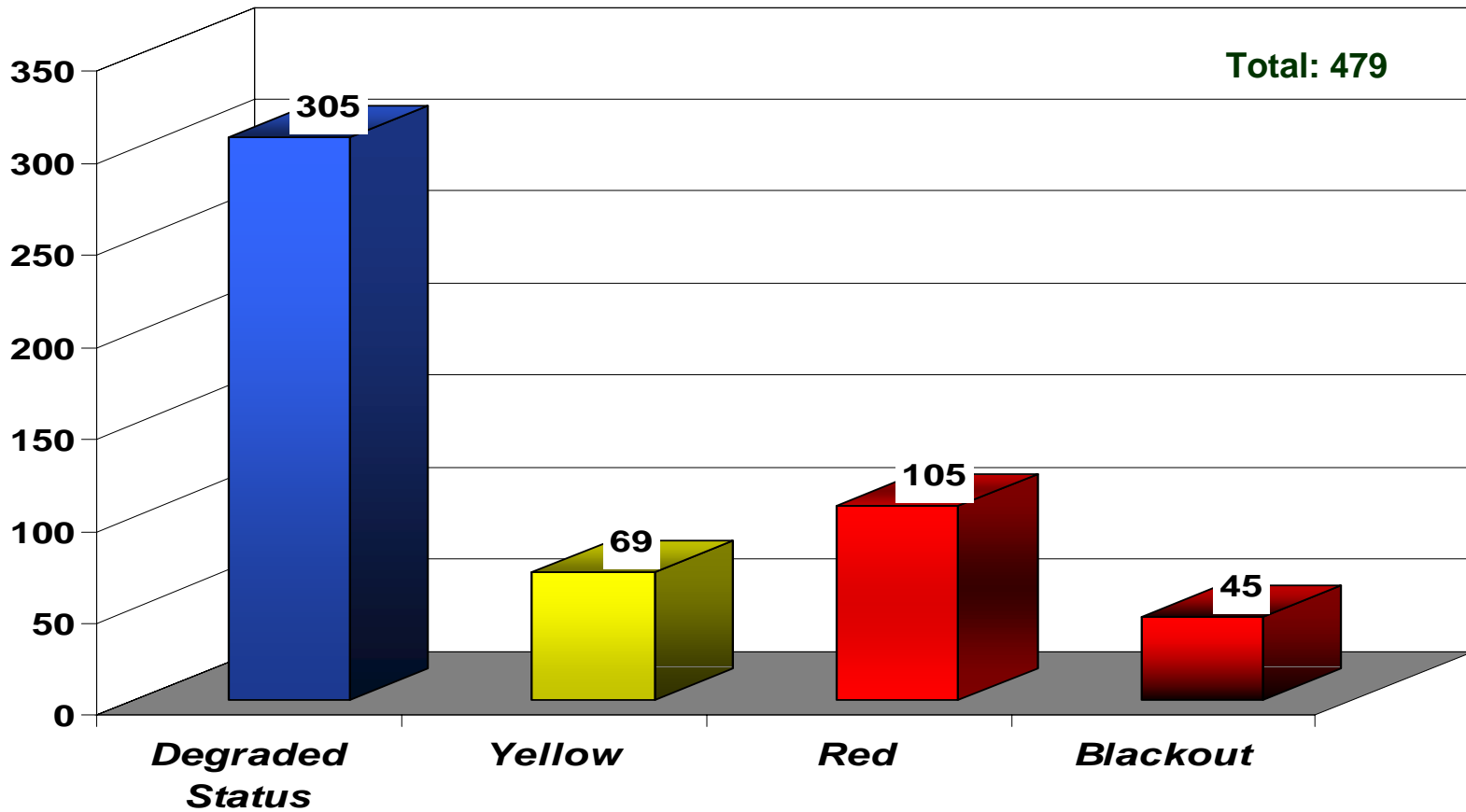
CAUSE	EFFECTS	CONSEQUENCE
Loss of Redundancy	Degraded	Without loss of position - Possible cease of operations (Critical Operation)
Progressive loss of station keeping capability	Yellow Alarm/ Red alarm	Loss of position under control – preparing for disconnection => disconnection
Sudden loss of station keeping capability (ex: black out)	Straight Red Alarm	Loss of position without control => Immediate disconnection



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DP Incidents 1992 - 2005

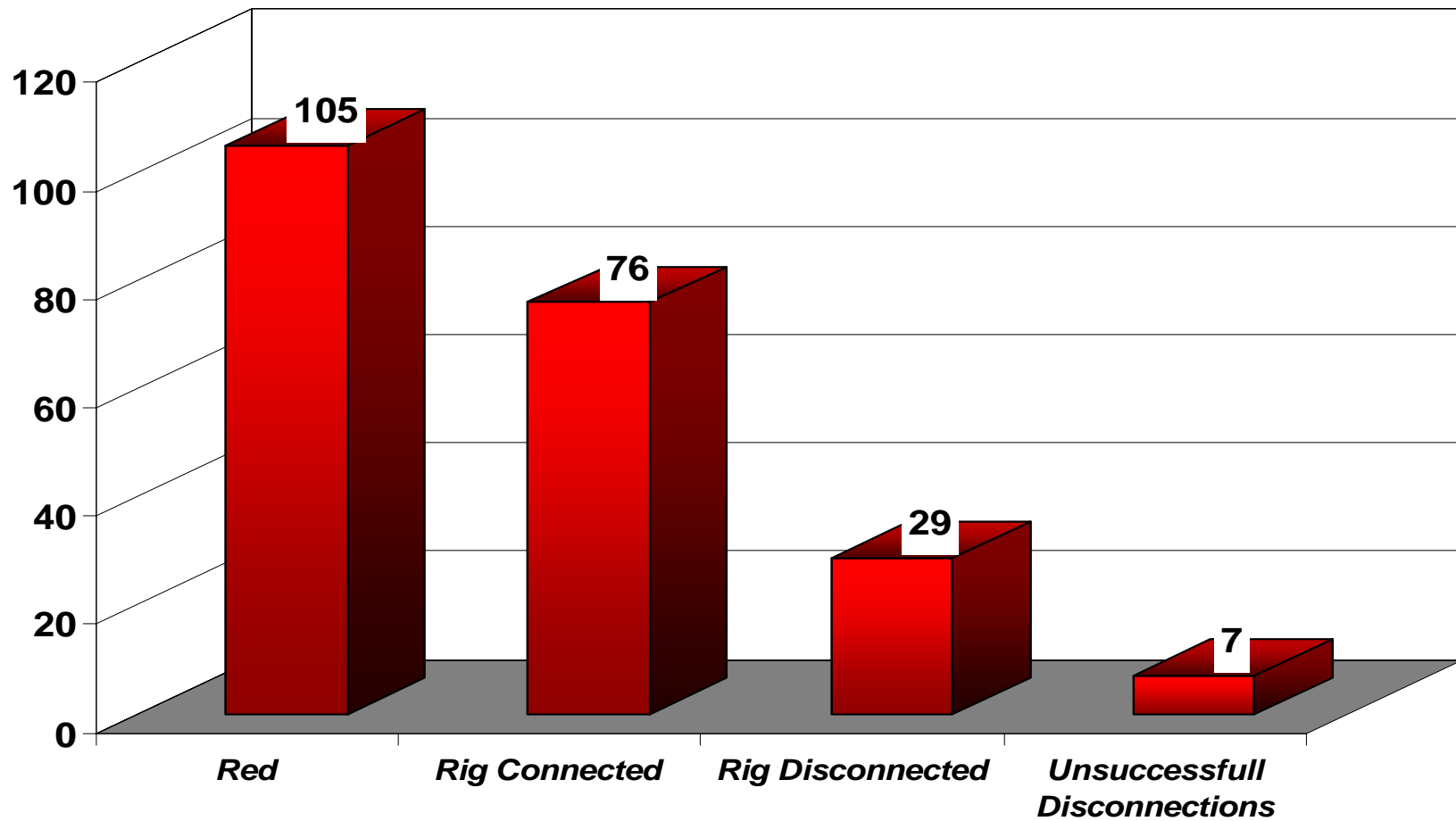




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Red Alarm vs Disconnections -1992/2005



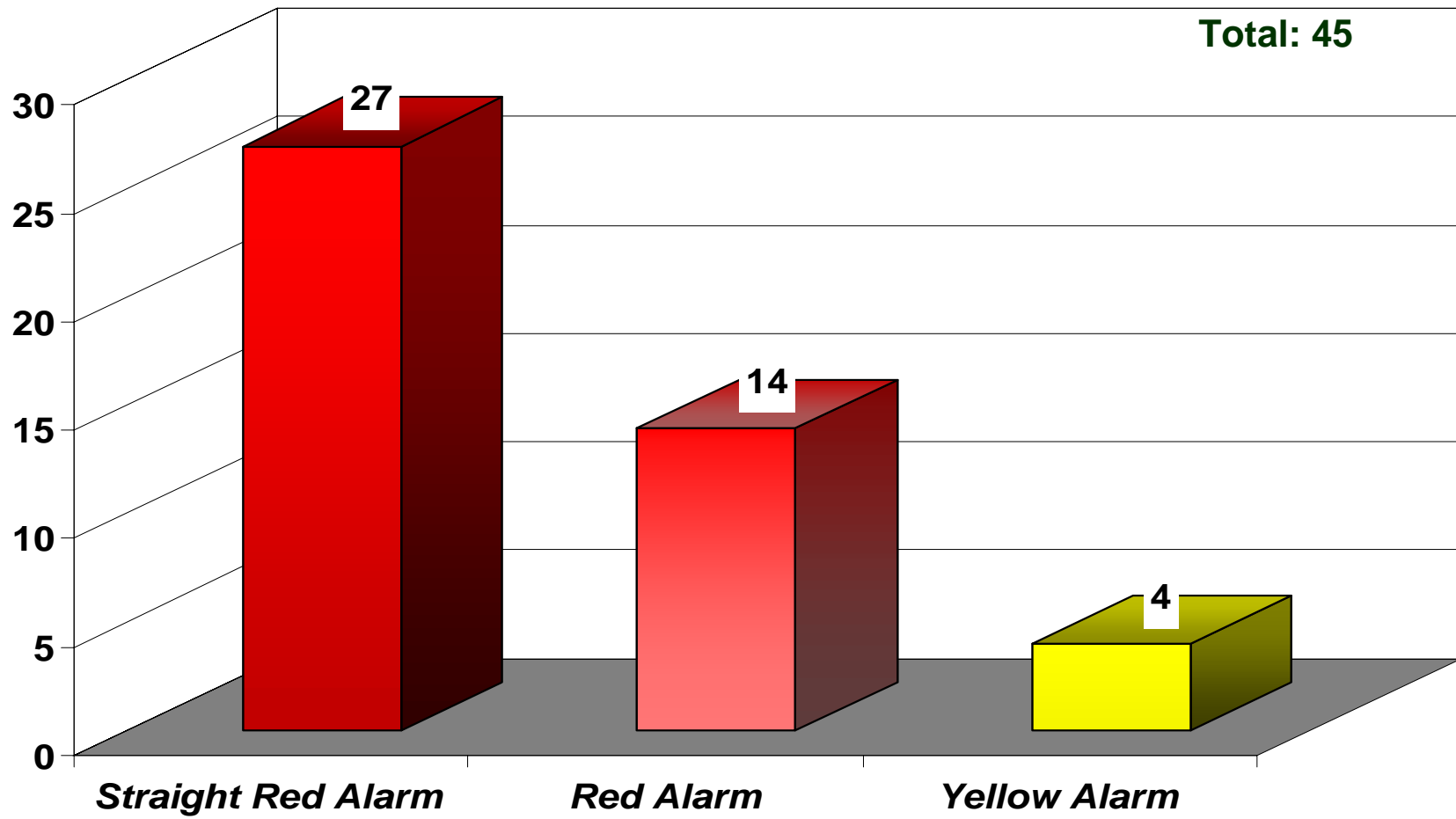


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Blackout - Type of Incident -1992/2005

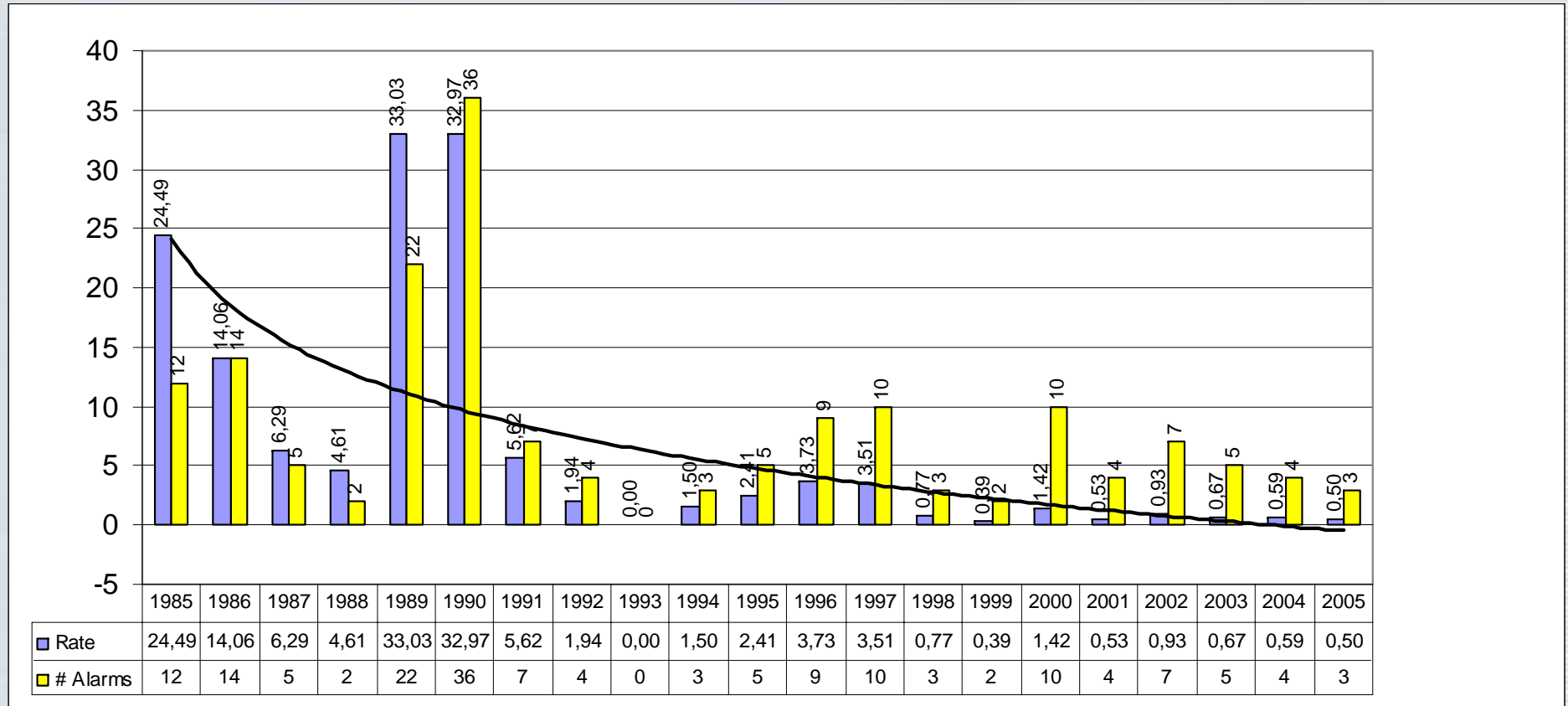




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Yellow Alarm vs. Working Hours

1985-2005

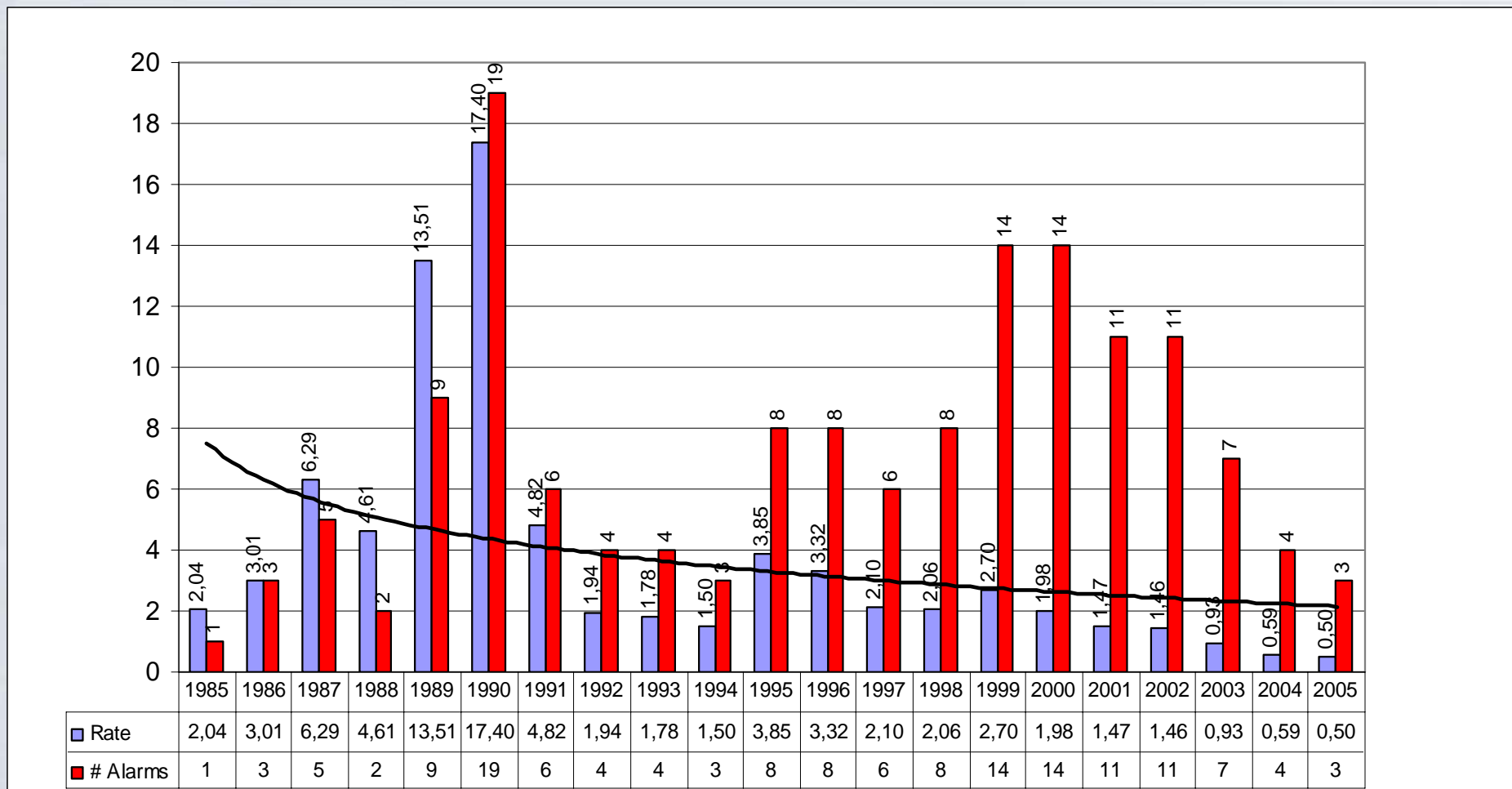




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Red Alarm vs. Working Hours

1985-2005

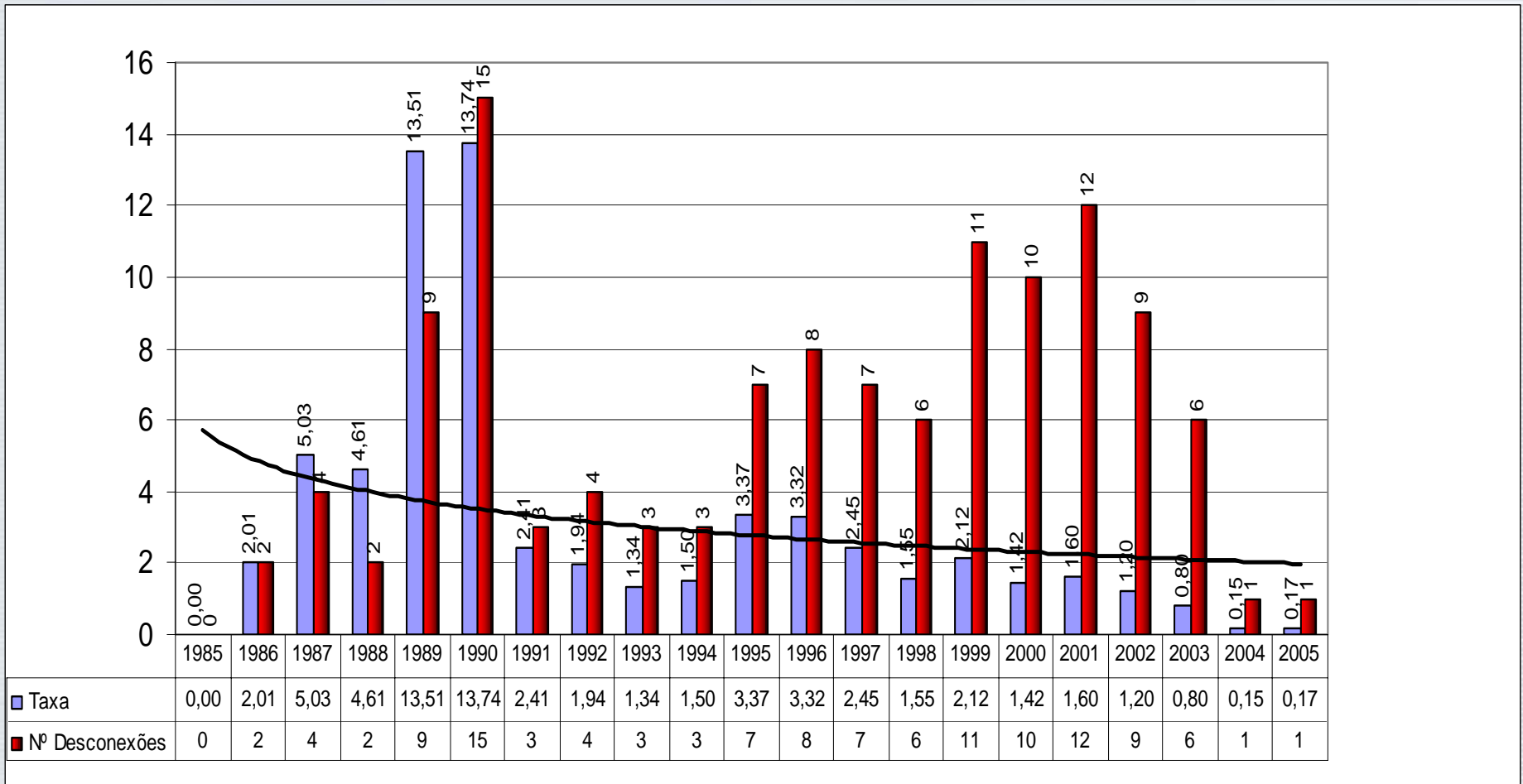




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Disconnections vs. Working Hours

1985-2005

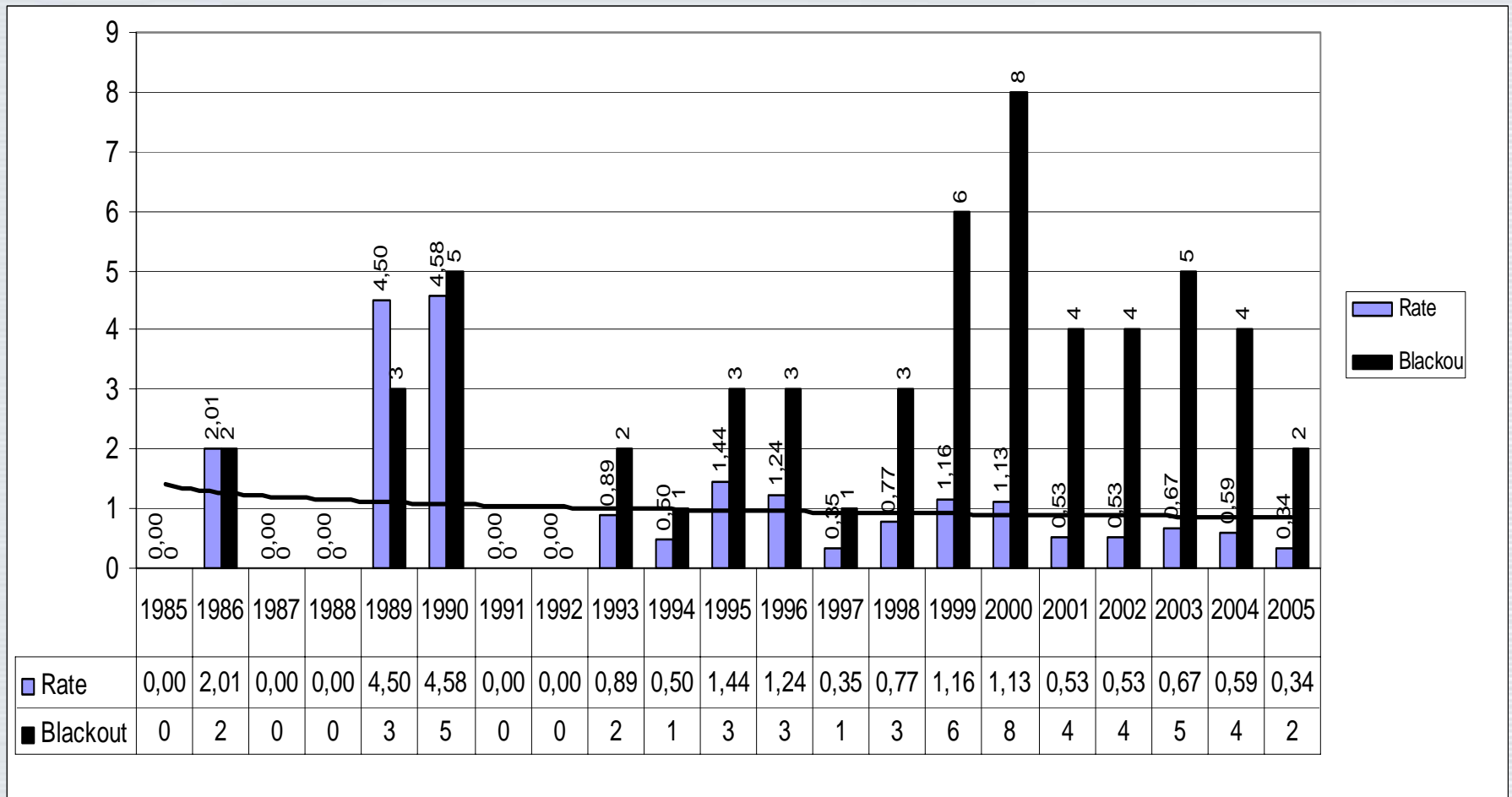




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Blackouts vs. Working Hours

1985-2005





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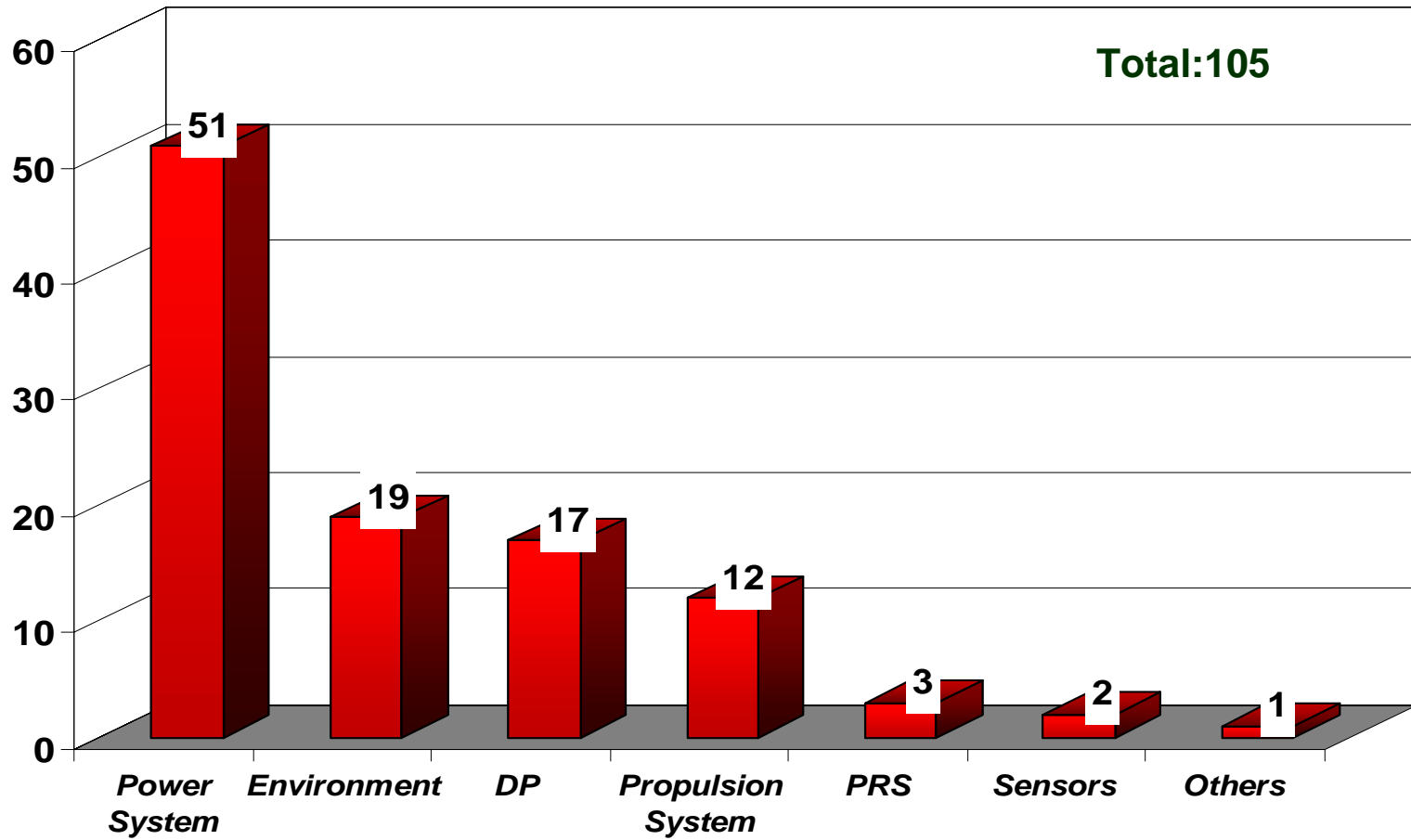
Failure Root Causes & Trigger Systems and Points



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Red Alarm - Trigger System -1992/2005

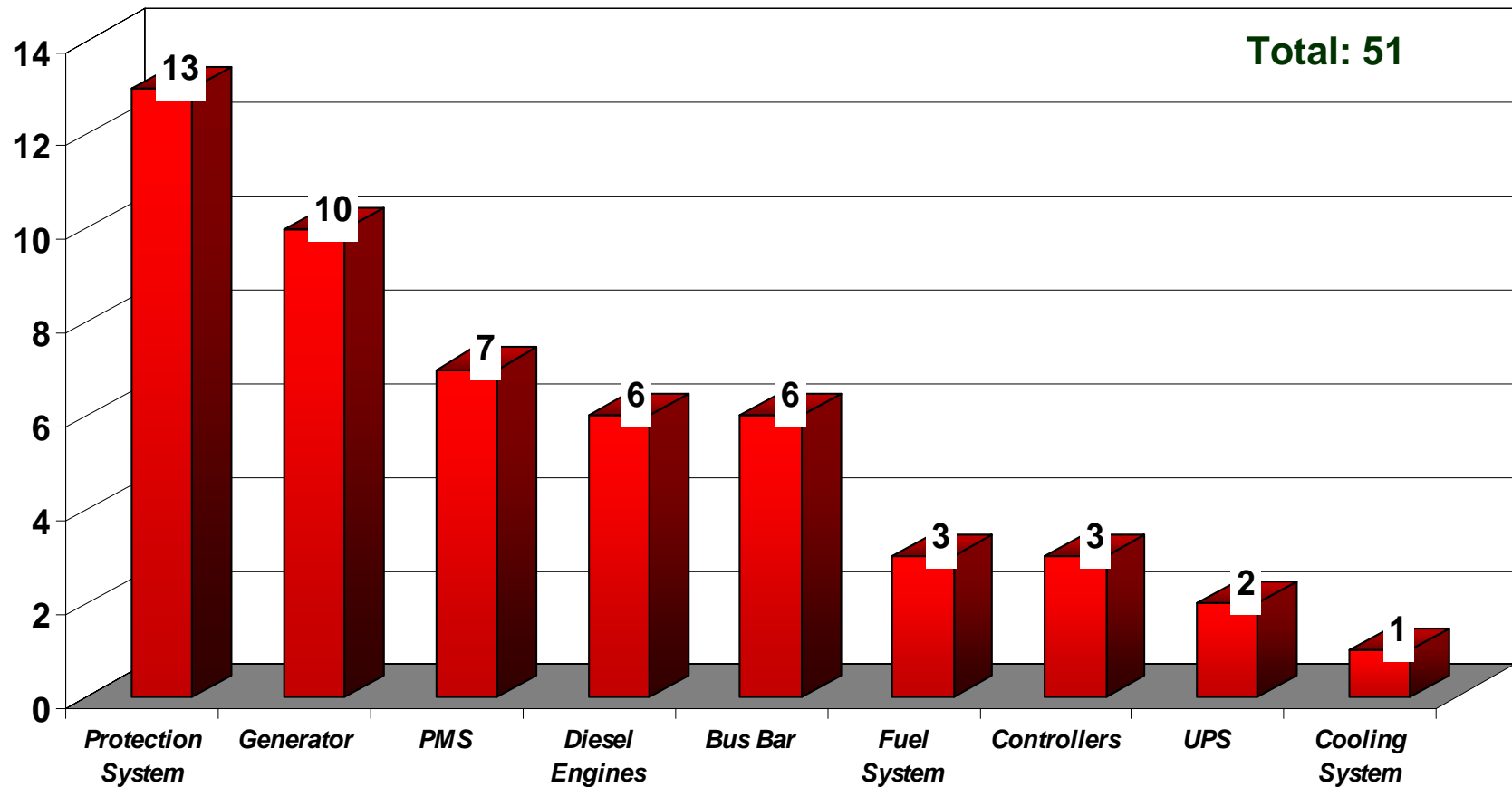




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Red Alarm - Power System -1992/2005 Trigger Point

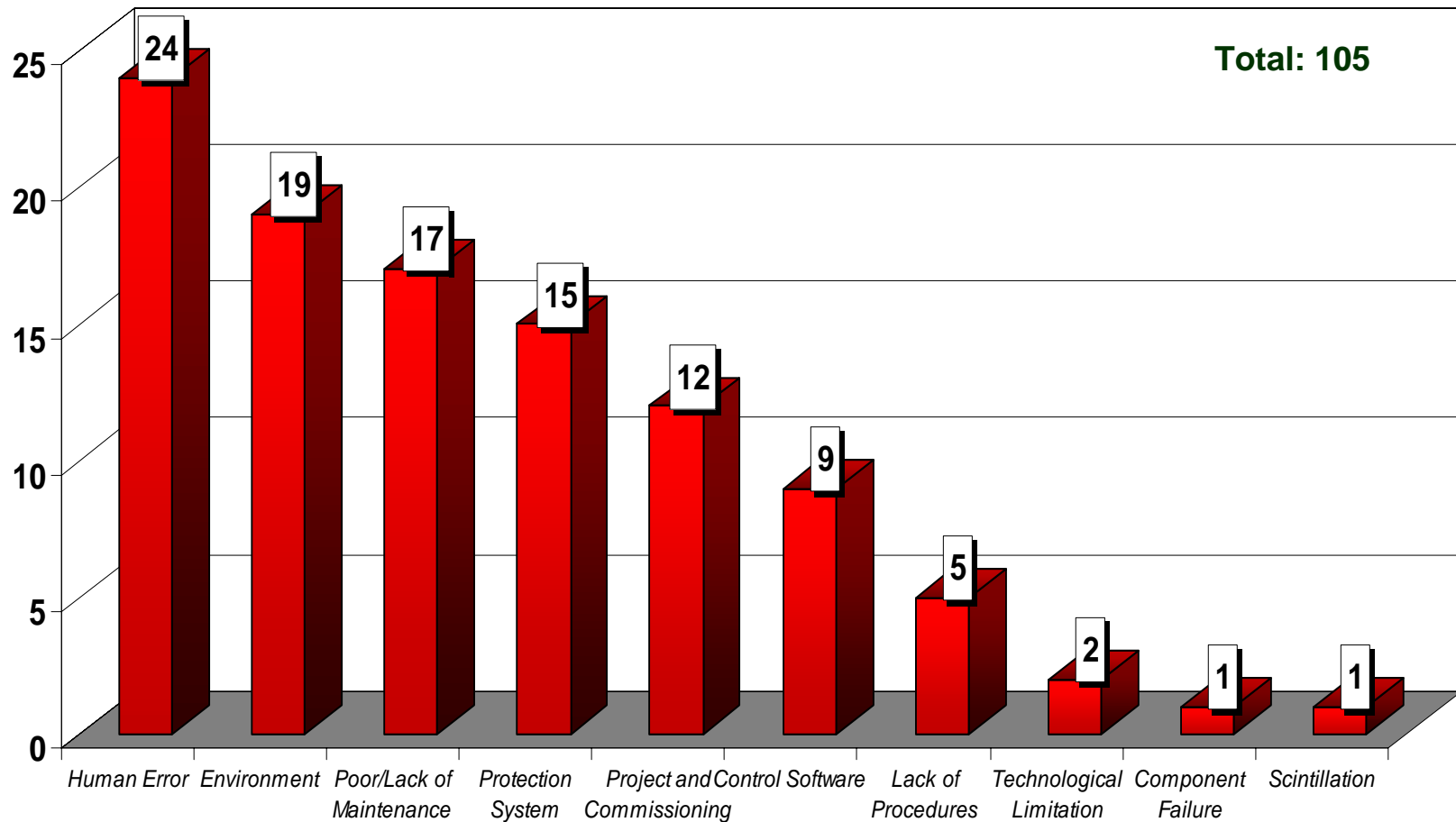




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Red Alarm - Root Cause - 1992/2005

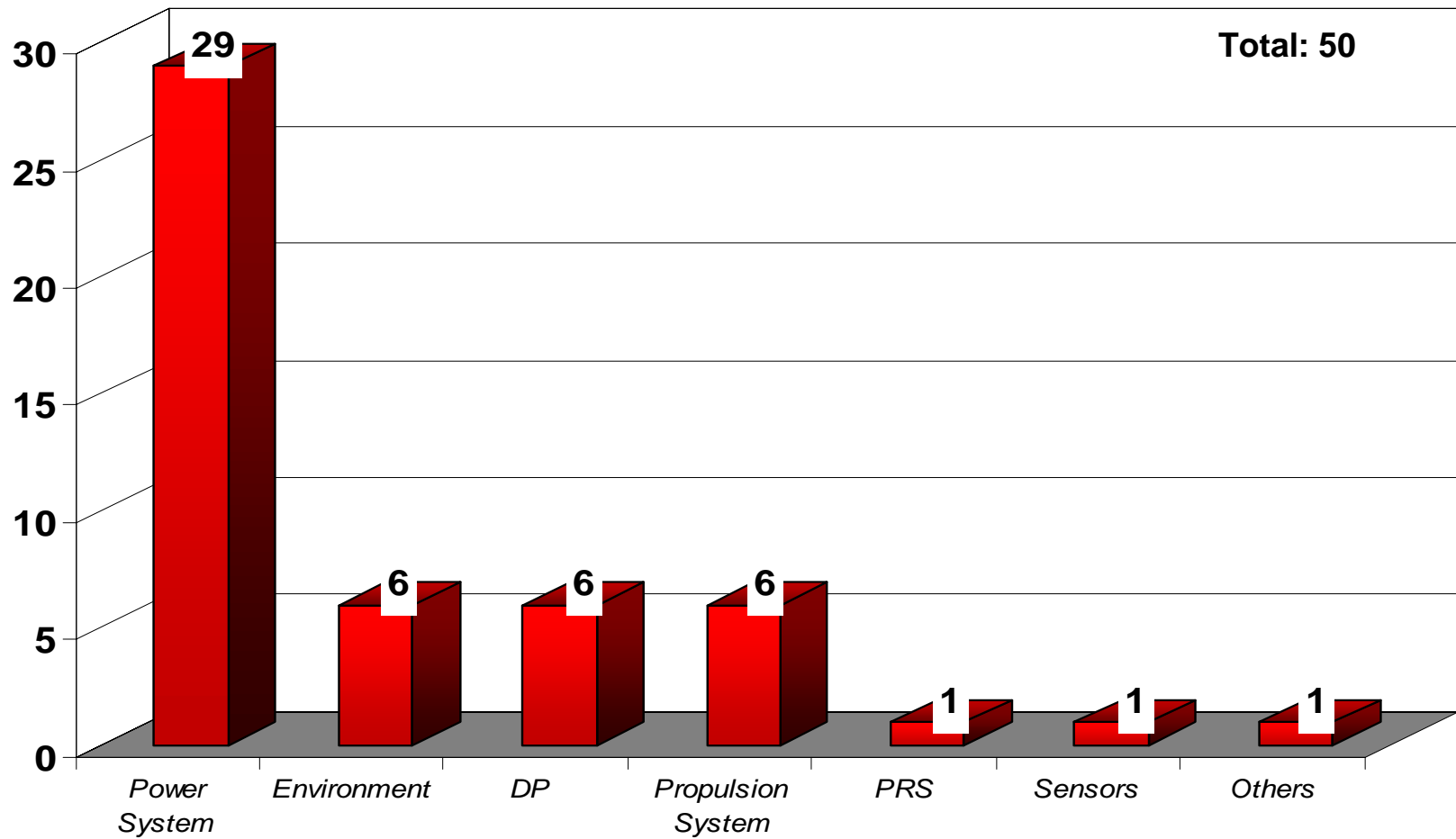




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Red Alarm - Trigger System -2000/2005

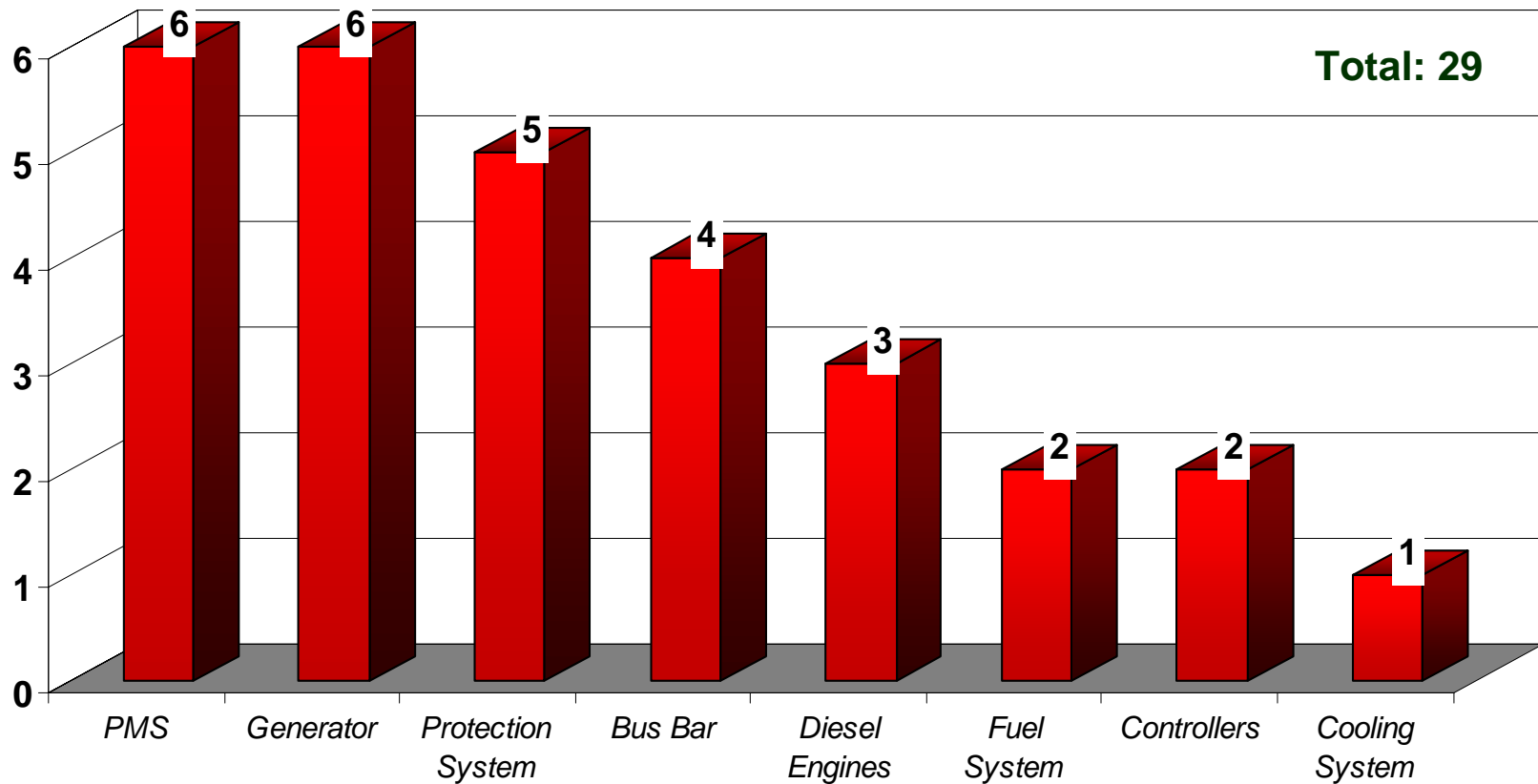




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Red Alarm - Power System -2000/2005 Trigger Point

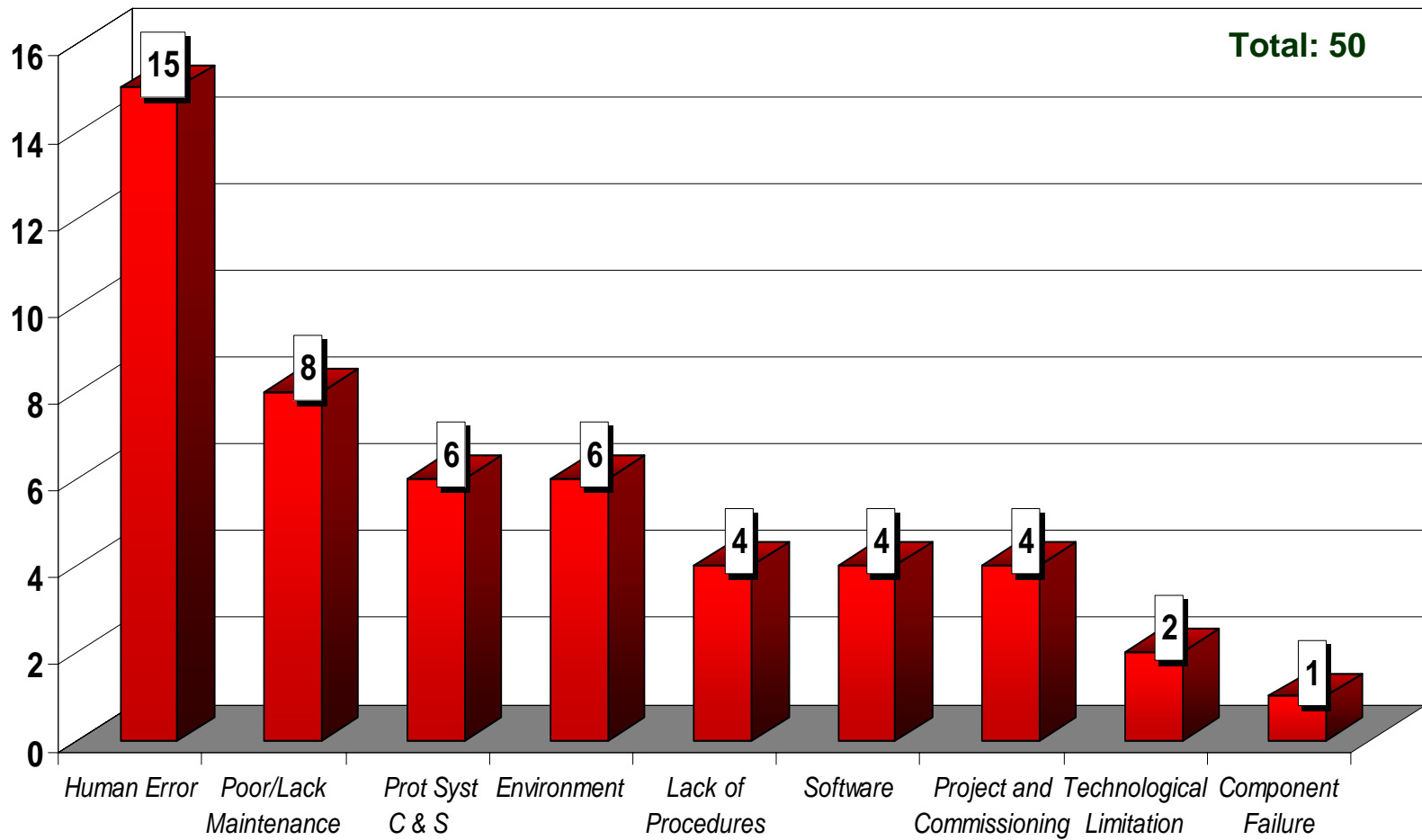




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Red Alarm - Root Cause - 2000/2005

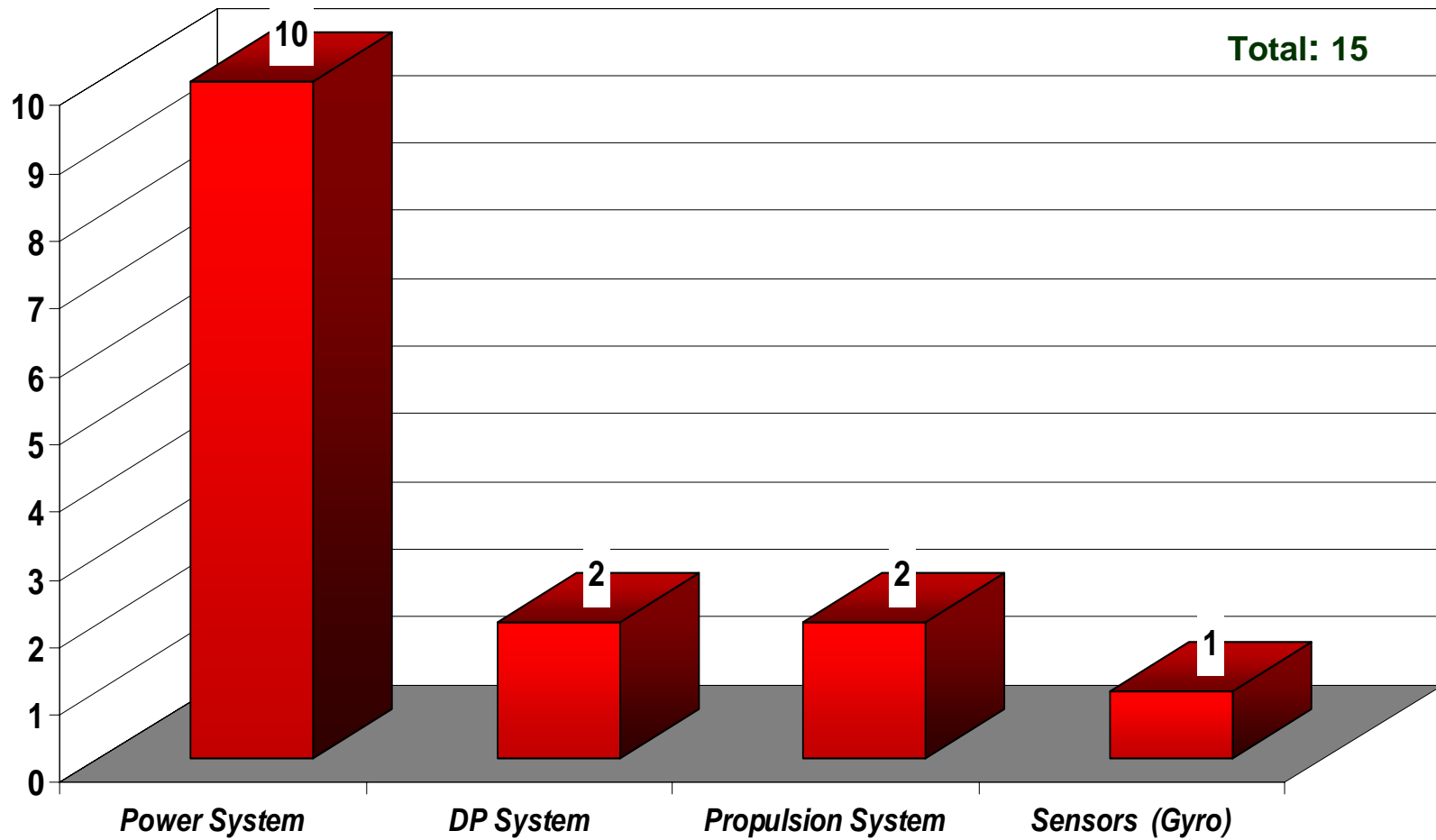




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Red Alarm - Trigger System - Human Error - 2000/2005

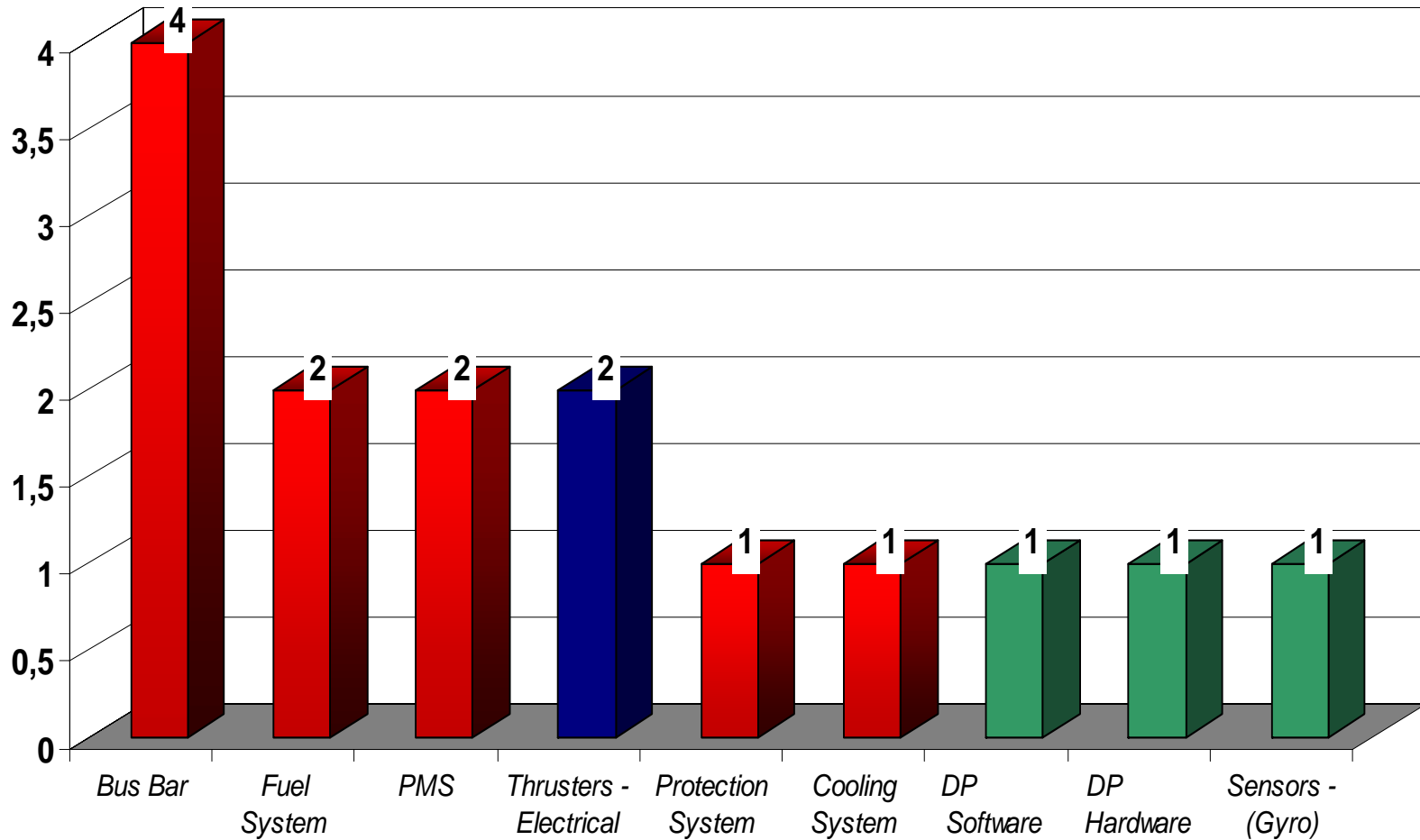




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Red Alarm - Trigger Point - Human Error - 2000/2005



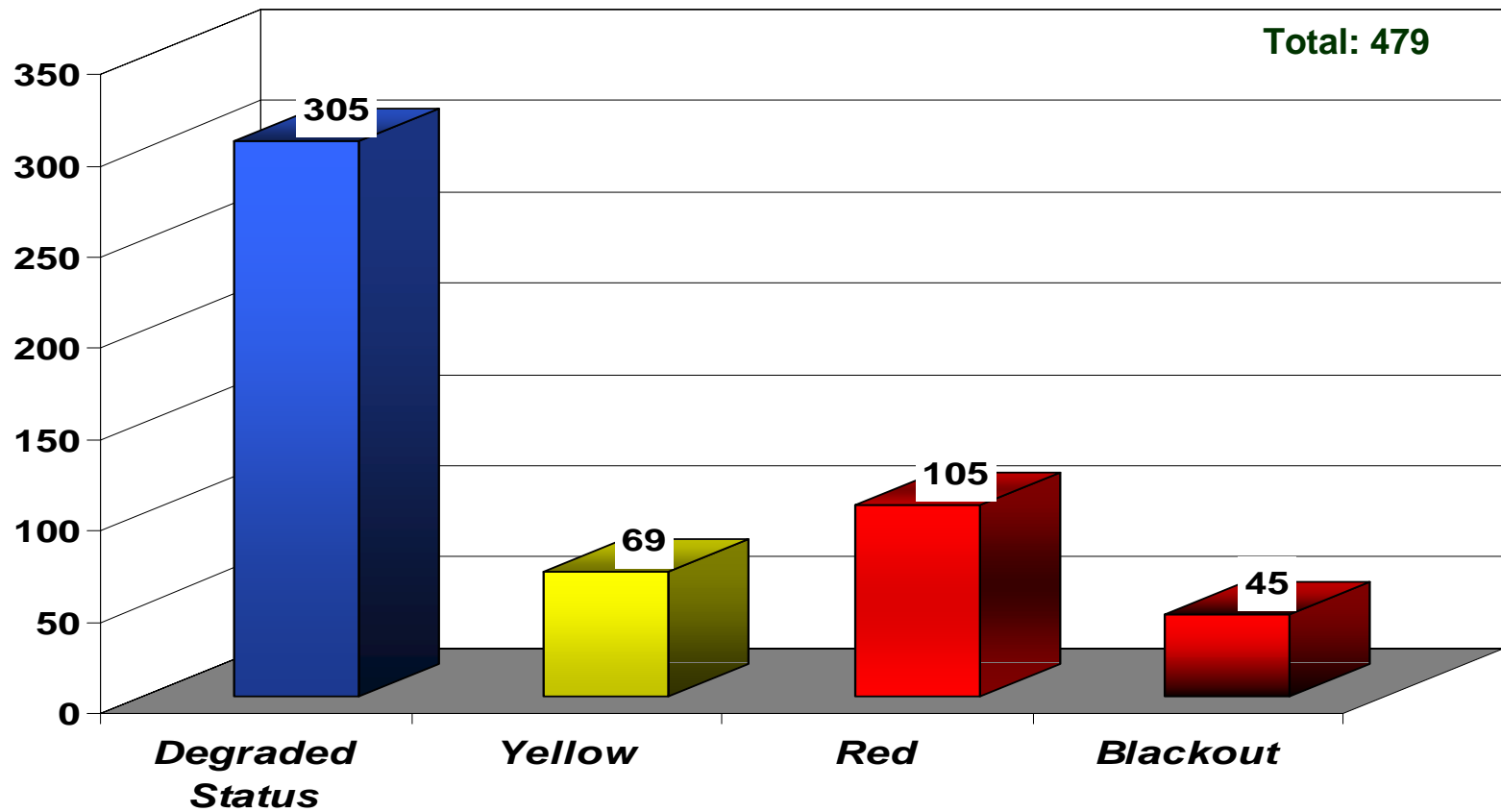


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DP Incidents 1992 - 2005

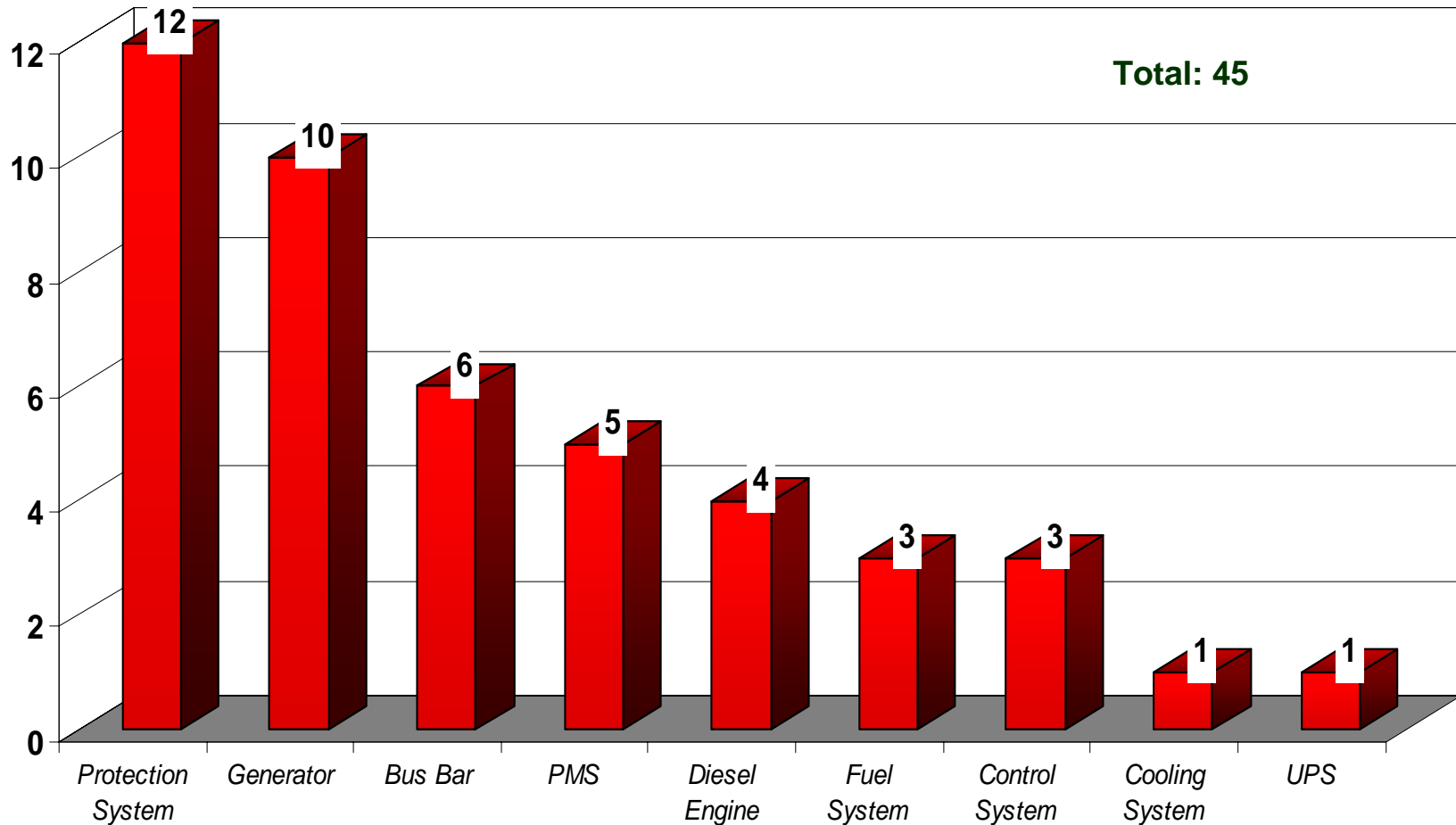




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Blackout - Trigger Point - 1992/2005

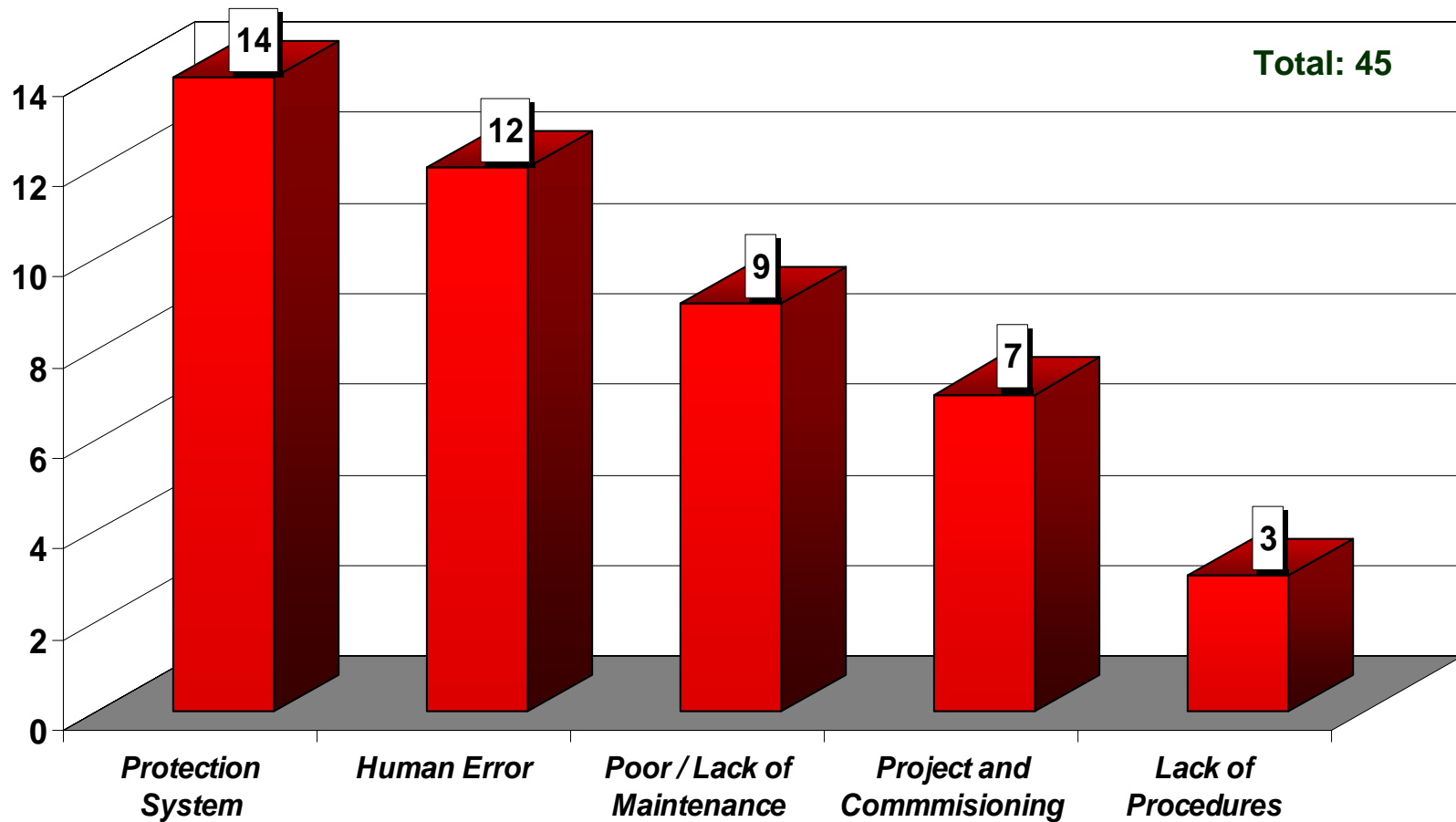




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Blackout - Root Cause - 1992/2005

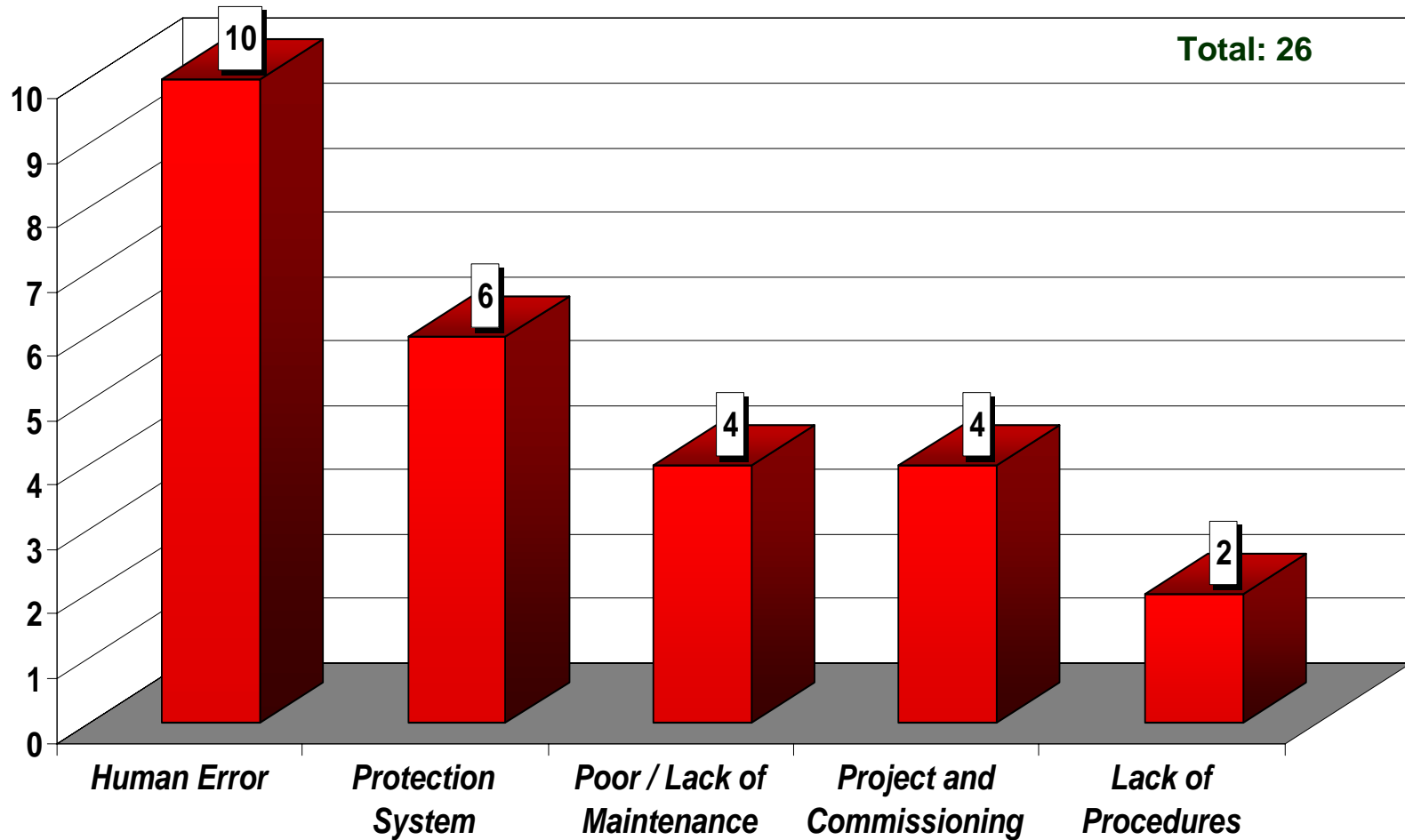




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Blackout - Root Cause - 2000/2005





- ✓ **Objective:** to look for root causes for incidents classified as *human error* on DP-operated vessels suggesting an action plan to avoid them to happen.
- ✓ **Components:** Petrobras + Schahin + Diamond + Transocean + Noble + Pride + Ventura



HUMAN ERROR – WORKGROUP

1. Ineffectiveness of on-job-training for DPO / SDPO as well as for new DPO Certification
 2. High turnover among companies or even within the same company
 3. Few opportunities for practicing or not enough time to be familiar with the system
 4. Inadequate supervision
- ✓ *Theoretical training for DP/ECR personnel*
 - ✓ *Practical training on board for DP/ECR personnel*
 - ✓ *Training on DP/VMS simulators*
 - ✓ *Make DP/ECR a worthy team*
 - ✓ *DP personnel hiring as part of a bigger process*



HUMAN ERROR – WORKGROUP

5. Poor handover causing incidents due to the lack of details about ongoing operations.

✓ *Improve handover*

6. Poor communication process among departments (DP / Rig Floor and DP / ECR).

✓ *Improve communication process among DP/ECR/RIG FLOOR by cross training.*

7. Stressful situations caused by less experienced operators combined with more activities/responsibilities.

8. Long time in front of the console (DP, VMS, etc).

9. High noise, lack of attention, amusement for chatting in close coffee shops (Bridge, ECR).

✓ *Improve work conditions for DP/ECR personnel*



10. Poor motivation or attitude

11. Experienced people's overconfidence

12. Lack of specific procedures

✓ *Improve confidence/motivation by HR programs.*

✓ *Create procedures making them available*

13. Poorness/Absence of manuals especially after upgrades

✓ *Organize and update technical documentation*

14. Poor automation asking for human interference

✓ *Automate non-critical DP/ECR systems*



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Thank You !

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Questions?

You can send your questions or comments to:

gbeduhn@petrobras.com.br