

Author: Mark Foxwell, Steve Savoy	<div style="text-align: center;"> ENSCO 7500  </div>	Ref: E7500-
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Approved By: John Knowlton		Issued: 28 March 2007
		Revision: 8

RIG SPECIFIC INFORMATION

SUBJECT: Drilling Operations Contingency Planning in High-Current Areas

Purpose : **To provide guidance to the DPO, OIM and Company Representative for operating the ENSCO 7500 in high-current areas of the Gulf of Mexico.**

To facilitate the safe securing of the well and to minimize the risks to personnel, to the environment, and to the vessel, contingency planning while drilling in high-current areas must be done when high currents or forecast high currents are imminent.

The loop currents and associated eddies in the Gulf of Mexico can be severe at times. Three-knot surface currents, especially near the perimeter of these events, are not uncommon. The effect these currents have on the operation depend on whether the BOP is connected or riser-less work is in progress.

RISERLESS OPERATIONS

The OIM, in consultation with the Company Representative, will determine the risks involved, the operating draft, and the DP watch circles to be maintained based on projected operations. The guidelines will be similar or less stringent than those defined in BOP CONNECTED OPERATIONS. The consequences of loss-of-station depend on the operation in progress. Riserless operations sometimes allow for a change in vessel draft, which can reduce forces imposed on the vessel by currents.

BOP CONNECTED OPERATIONS

The rig will normally maintain a 58 to 60-ft drilling draft for all routine operations. The OIM has the discretion to reduce the draft within design limitations in order to reduce environmental forces on the vessel. In calm seas, the ENSCO 7500 can maintain station keeping with approximately 3.0 knots of current depending on wind direction and velocity.

The consequences of disconnecting the riser under high-current conditions due to the loss of station-keeping ability are:

- Damage to the slip joint due to high riser angles; making it difficult to pull the riser.
- Harm to the environment due to the loss of the mud that was in the riser, which can be costly.
- Complicated fishing problems if the bit is near the bottom of the hole.

Other consequences following LMRP disconnect might include:

- The current may be forcing the rig towards shallow water or man-made obstructions.
- If the LMRP is to be recovered, the rig may have to drift with the current to be able to pull riser.
- The rig may have to de-ballast to survival draft if seas are predicted to increase.

NORMAL OPERATIONS

Normal DP operating conditions, as highlighted in **green** on the graph, are considered to be those allowing for normal vessel maneuverability, such as full freedom to change heading for enhanced operations, i.e., giving lee protection to supply boats alongside. During these periods, DP and operations personnel will review weather and current forecasts on a daily basis.

ADVISORY OPERATIONS – Zone 1

Advisory DP operations, as highlighted in **lime green** on the graph, allow for normal drilling operations to continue provided that certain steps are taken. These steps depend on the environmental conditions as defined by the chart.

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Upon reaching **Zone 1** or forecasts predict the rig will experience **Zone 1** environment within the contingency plan execution timeline, the DPO will immediately notify the OIM, and the following steps will be taken:

- OIM to notify the Company Representative and update the contingency plan that includes the estimated time to secure the well with all pipe inside the last casing shoe and to displace the riser with sea water.
- OIM to notify the Mechanical and Electrical Supervisors. All maintenance to engines and thrusters to be deferred or specifically agreed in advance until normal DP operations are resumed.
- OIM to inform Subsea and other supervisors that no non-essential work in the moonpool, at the riser tensioners, or over the side should be planned until normal DP operations are resumed.
- DPO to review weather forecasts at least once every six hours and plot the rig's station holding capability based on the forecast, then advise OIM if transition to **Zone 2 or 3** is predicted.
- If **Zone 3** is predicted within the time required to secure the well and displace the riser, operations are to be suspended immediately and the well secured.
- Company Representative to notify the ROV supervisor of currents over 2 knots since launch and recovery of the cage may not be possible.
- Company Representative to determine if boats in the area can aid in current reading measurements and forecasts for the rig's location.

GUARDED OPERATIONS – Zone 2

Upon reaching **Zone 2**, as highlighted in gold the DPO will immediately notify the OIM, and the following steps will be taken:

- OIM to notify the Company Representative that while in **Zone 2** no critical operations will commence (without a risk assessment and Rig Manager approval) including running casing or liners through the BOP stack, and drilling in hydrocarbon bearing formations.
- DPO to review weather forecasts at least once every three hours and plot the rig's station holding capability based on the forecast, then advise OIM if transition to **Zone 3** is predicted.
- If **Zone 3** conditions are predicted within the time required to secure the well and to displace the riser, operations are to be suspended and the well secured.

SUSPEND DRILLING OPERATIONS – Zone 3

Suspend drilling operations, also called **Zone 3**, as highlighted in yellow on the graph, are near the limits of the vessels holding capabilities and rig heading maintenance is critical. The required heading may not be ideal for drill floor operations. At this point the OIM may elect to cease certain or all drill floor operations, regardless of the status of the planned well suspension.

Upon reaching **Zone 3** the DPO will immediately notify the OIM, and the following steps will be taken:

- DPO to confirm with OIM that well is secure, riser is displaced, and riser tension has been adjusted for change in mud weight.
- Once the preceding conditions are confirmed, *The Red Watch Circle for disconnect of LMRP is to be reduced to a suggested 50 ft.* This will reduce the risk of slip joint or other damage in the event of position loss.
- If forecasts indicate further deterioration of weather or currents, the OIM has the authority to immediately disconnect and move the vessel to deeper water and/or begin pulling riser.

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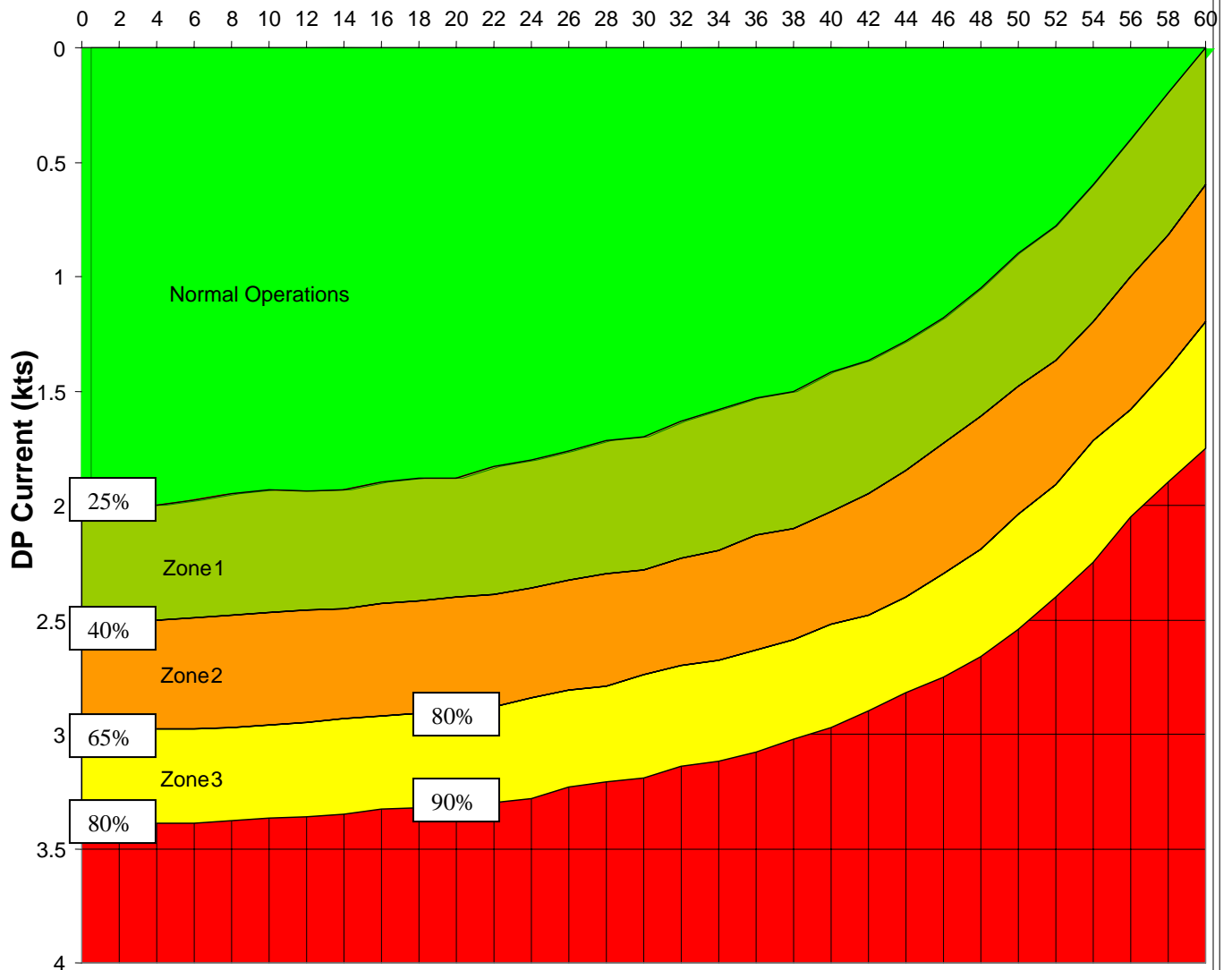
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Environmental Guidelines

Wind Velocity (kts)



Note: Percentages of Full Capacity for Seven Thrusters
(No Bias Included)

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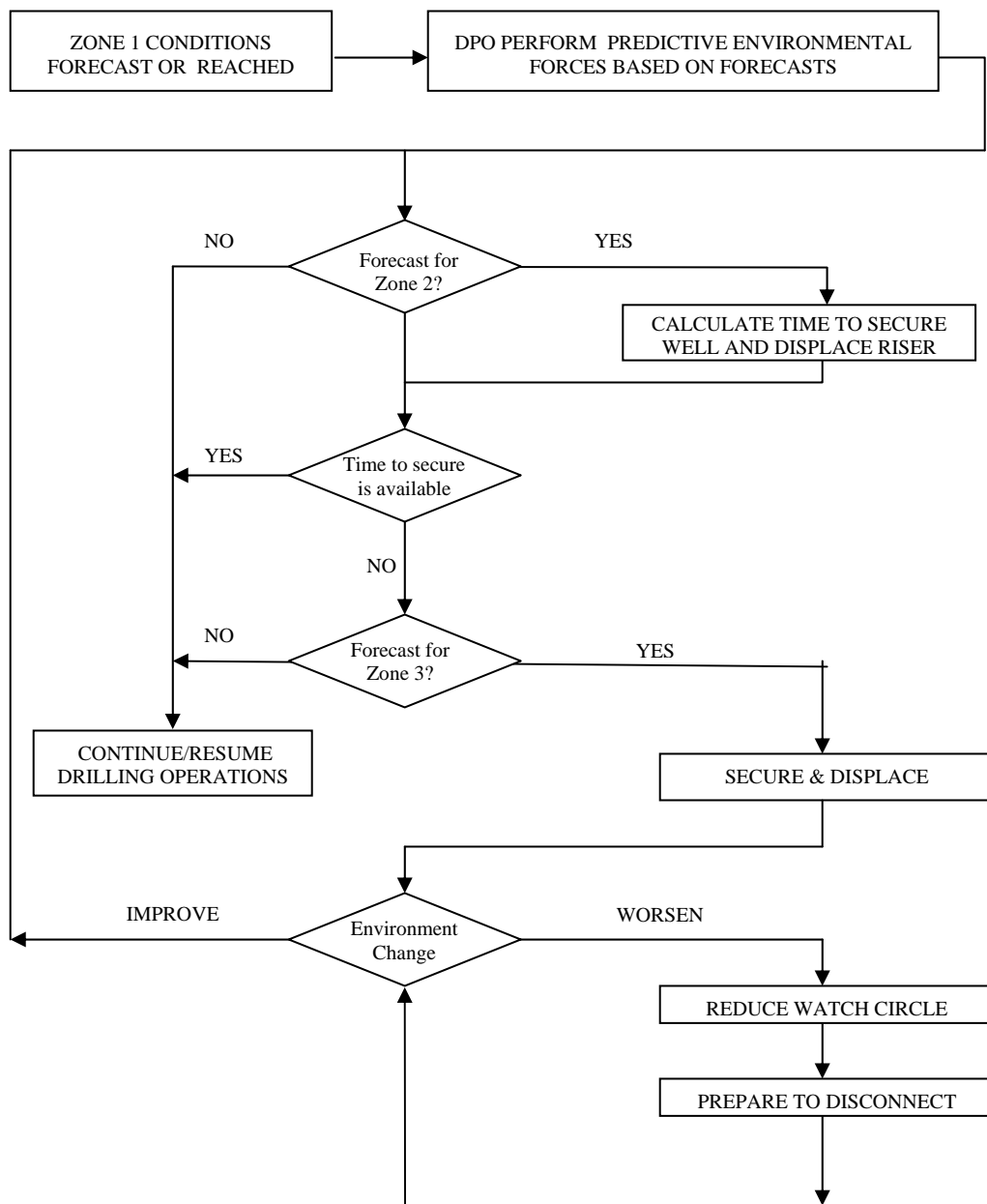
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ZONE THRUSTER POWER LEVELS

The Zone power levels are based on data calculated by the consequence analysis feature of the dynamic positioning system. The data is consistent with the published rig holding capability plots. The percentages of thrust levels use seven thrusters online with one in standby. This ensures a redundant thruster that can be used in the event of a hardware failure. The following table shows the percentage of thruster load in relation to the Zones. These values do not include any additional loading due to Bias levels. If bias is being used it must be subtracted from the total thruster load to give the load due to environmental forces. The percentages for seven (7) thrusters online show the levels for transition to the next level.

Thrusters on line	Percent of thruster load to reach the indicated zone			
	Zone 1	Zone 2	Zone 3	Max.
1				
2	88%			
3	58%	93%		
4	44%	70%		
5	35%	56%	91%	
6	29%	47%	76%	93%
7	25%	40%	65%	80%
8	22%	35%	57%	70%

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Conditional Risk Action Matrix

The following matrix lists operational conditions that require an operational decision based on the severity of situation. There are five conditions that can occur –

Normal Operation -No actions are required.

Zone 1 Advisory – Risk assessment with regards to planning is required.

Zone 2 Guarded - Risk mitigation plans to commence.

Zone 3 Yellow – Prepare to disconnect with hang-off position and riser displacement.

Red – Disconnect BOP.

The Blackout condition would require immediate action where as the others would depend on the severity of the condition. In all conditions, a Disconnect will occur if the rig position exceeds 5% of water depth (WD).

Condition	Normal	Advisory	Guarded	Yellow	Red
DP System – Loss of Redundancy				Immediate	Exceed 5% of WD
DP System – Loss of Position				> 2.5% WD	>5% WD
DP System – Exceed Flexjoint Angle				>2.5° Angle	> 5° Angle
Power Loss - Blackout				Immediate	Exceed 5% of WD
Thrust Capacity (Seven Thrusters) due to Environmental Loads	< 25%	<40%	<65%	<80%	>80%
Power Generation Capacity (of Total Capability)		< 80%		>80%	Exceed 5% of WD