DRILLSAFE

AUSTRALIA'S DRILLING INDUSTRY
QUARTERLY HSE FORUMS

Rig Positioning

ENSCO 56 Adjacent To Ocean Legend

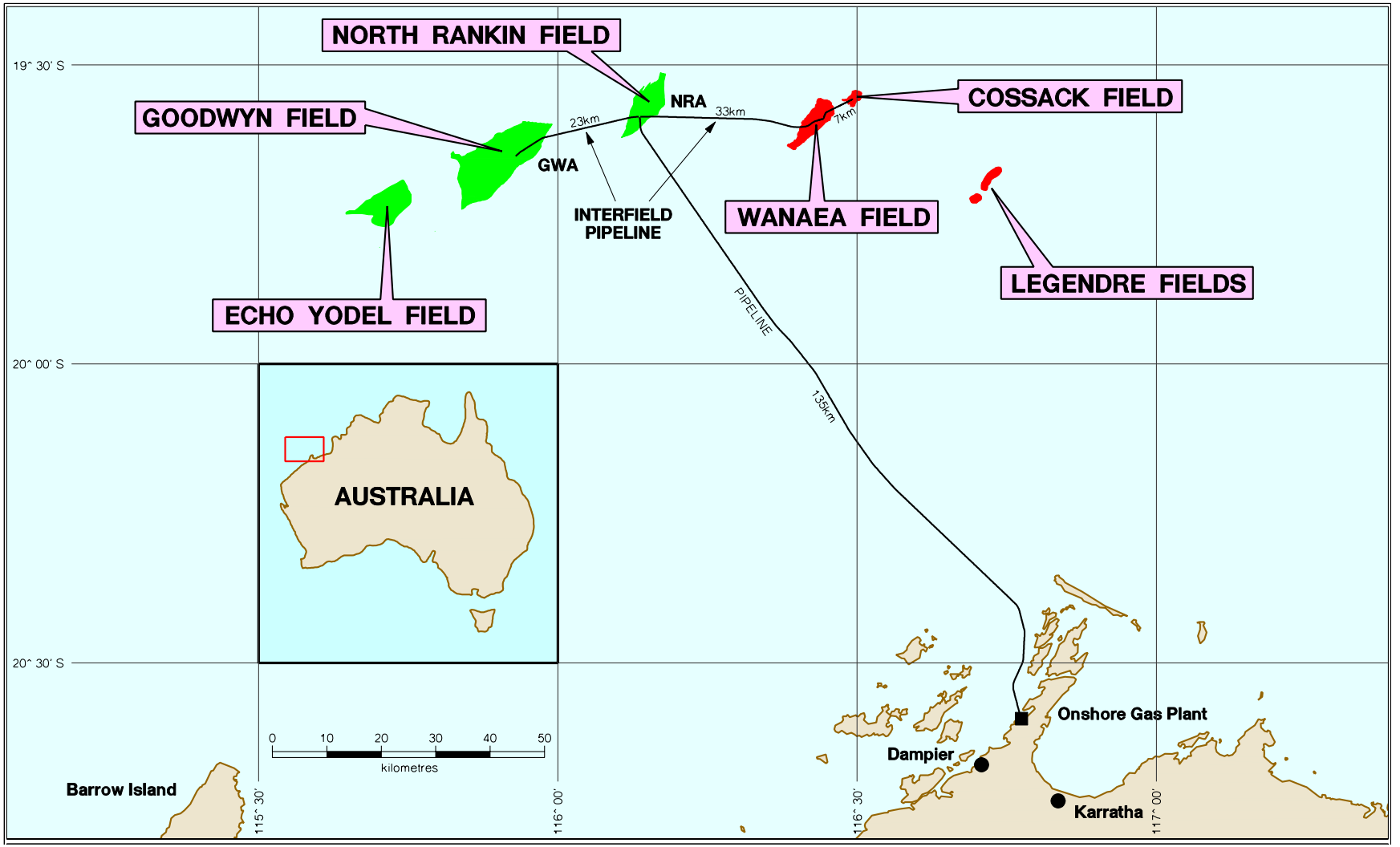
Incident

Craig Duncan

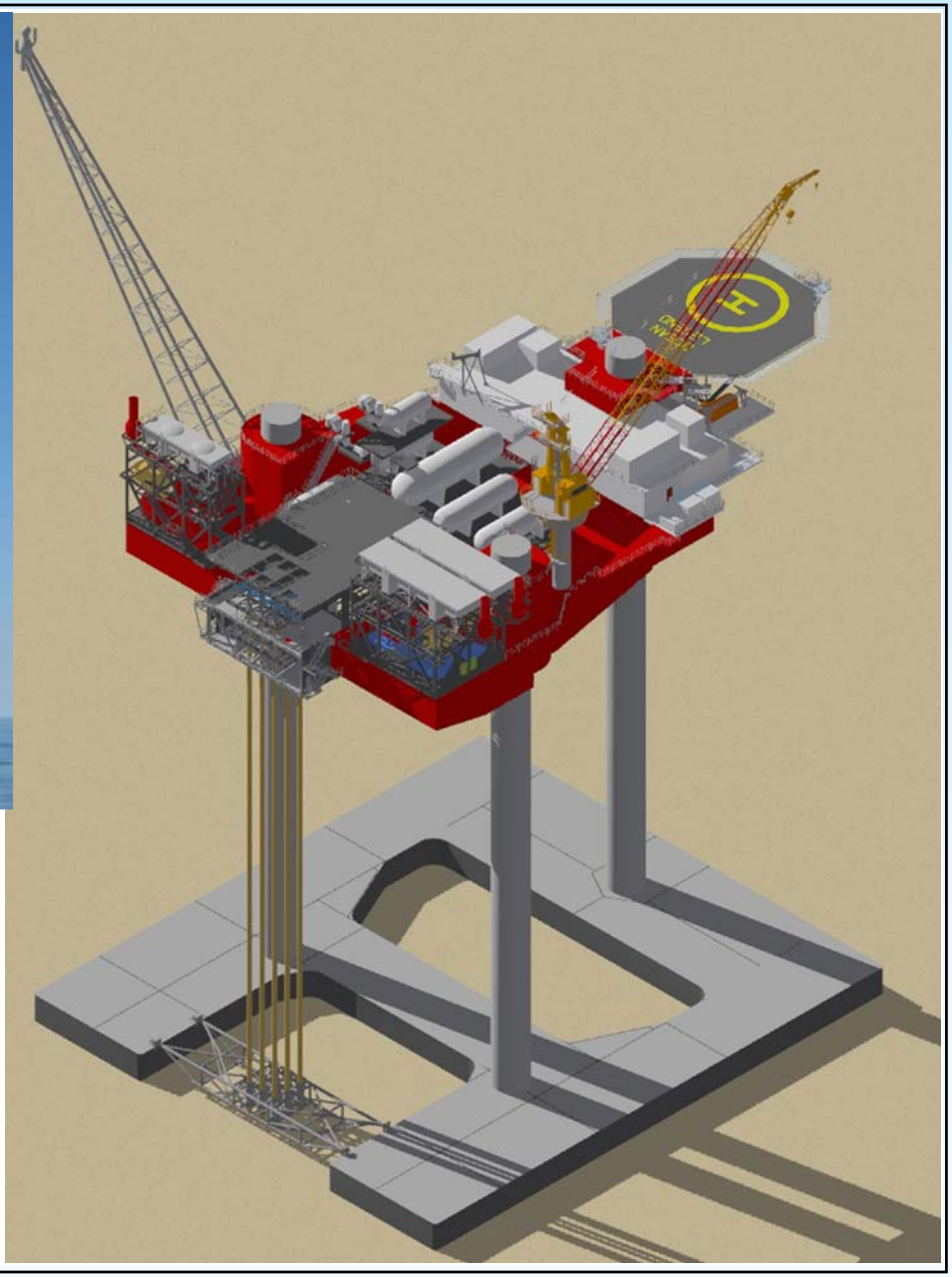
Companies Involved

- **Woodside** - Operator of the permit on behalf of the WA-1P Joint Venture Partners
- **Apache** – Joint Venture Partner contracted to plan and execute the work
- **Santos** – Joint Venture Partner with no active role in the day to day operation
- **Ensco** – Owner and operator of Ensco 56 – contracted to provide drilling services
- **Oceaneering** – Owner and operator of Ocean Legend – the production facility
- **Tidewater** – Owner and operator of Massive Tide & OSA Voyager – workboats
- **Mermaid Marine** – Owner and operator of tugs contracted to assist in rig positioning
- **Adsteam** – Owner and operator of a tug contracted to assist in rig positioning

Ocean Legend – Located at Legendre Oil Fields



Positioning Ensco 56 adjacent to Ocean Legend

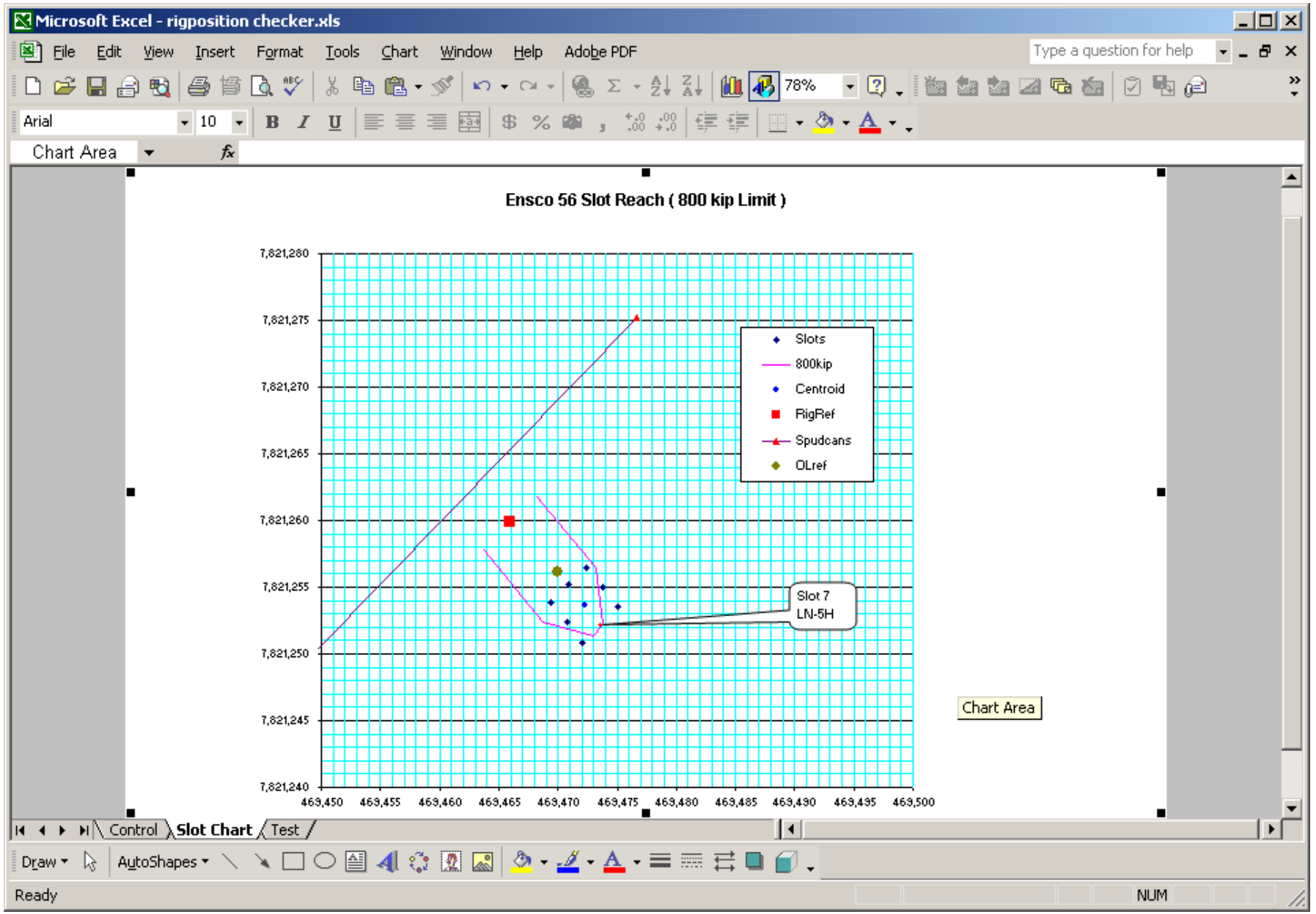


Ocean Legend as seen on approach and a 3D rendering of the platform.

Note that the mat extends beyond the edge of the hull as seen at surface

The Task Objective

- Position Ensco 56 adjacent to Ocean Legend such that the cantilever can be positioned over Slot 7 with a minimum 800 kip load capacity. This equates to:
    - 3.00m ± 0.75m separation at surface
    - 0.00m ± 0.75m centreline offset
    - 318.2° ± 2.00° on rig heading



Positioning Ensco 56 adjacent to Ocean Legend

Outline of the Incident

- Ensco 56 pinned about 100m from the platform in marginal weather conditions and hooked to two pre laid anchors.
- Some time was lost waiting on weather for suitable conditions.
- An attempt was made to position the rig but an anchor wire parted a few meters from the socket.
- After re socketing the anchor wire and waiting on weather again, another attempt to position was made. Close to final position, one of the rig anchor fairleads failed.

Outline of Incident

- Contingency plans were activated but the rig came closer to the platform than intended.
- The rig was pulled back away from the platform and pinned safely.
- Repairs were effected and an incident investigation commissioned.
- The rig then positioned successfully adjacent to the platform within an acceptable tolerance.

Why A Successful Incident

- No one was hurt in this incident
- There was no major equipment damage in this incident
- Contingency plans to handle the incident worked to prevent escalation
- The investigation uncovered deficiencies that were rectified prior to resumption of the task
- Some of the knowledge and experience gained has / is being passed on to others

Sequence of Events

Ensco 56 commenced a tow from Gauguin-1 on 2nd May 2004

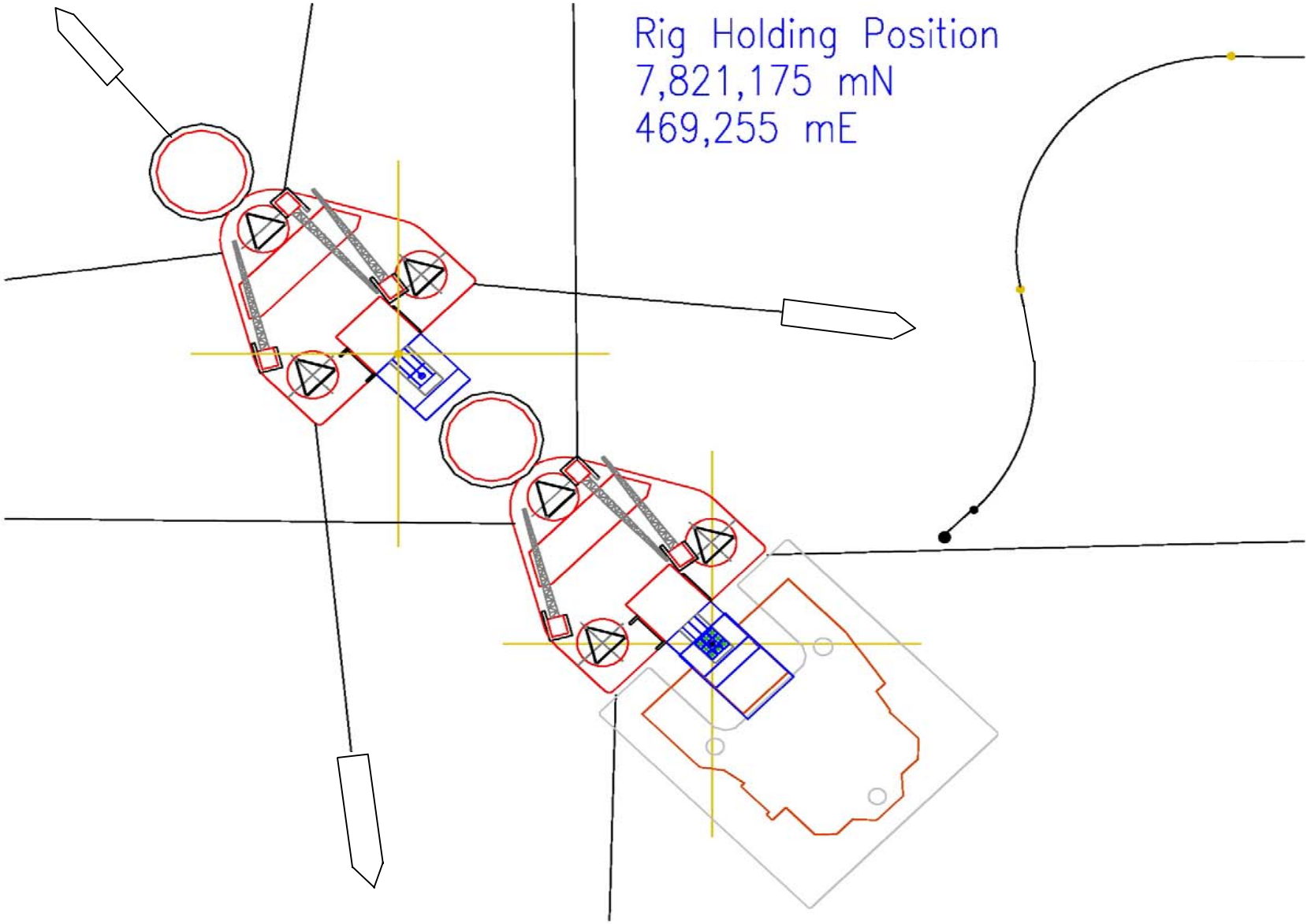
The tow was slowed down due to poor weather

Waited on weather until conditions improved and pinned rig about 100m from platform

Attached to preset anchors to the bow and tugs to the stern and load tested system.

Sequence of Events

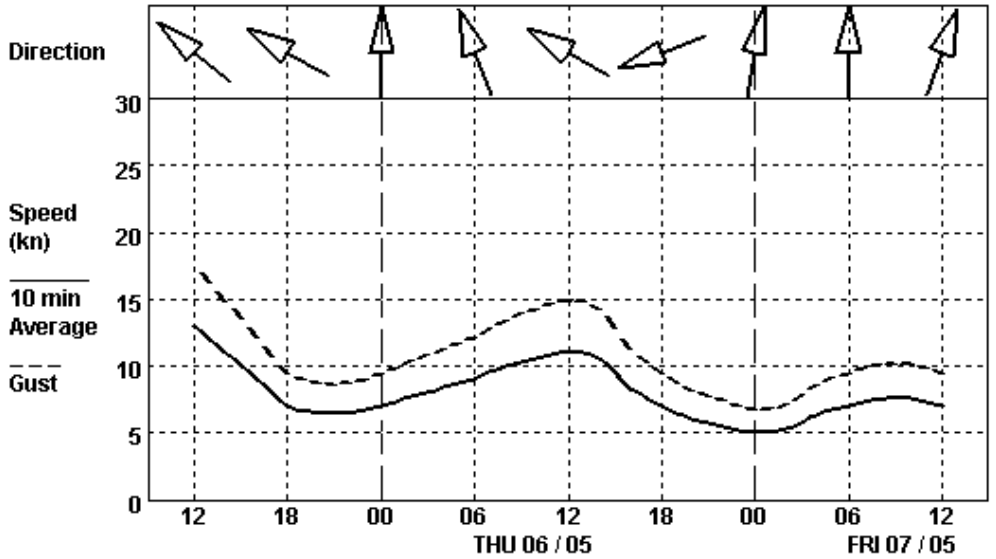
- Attempted to position rig but suffered an initial problem with a tug.
- Attempted to position rig but the port anchor wire parted near the socket end.
- Resocketed the wire and load tested the cable to winch stall load.



LEGENDRE

Positioning Ensco 56 adjacent to Ocean Legend

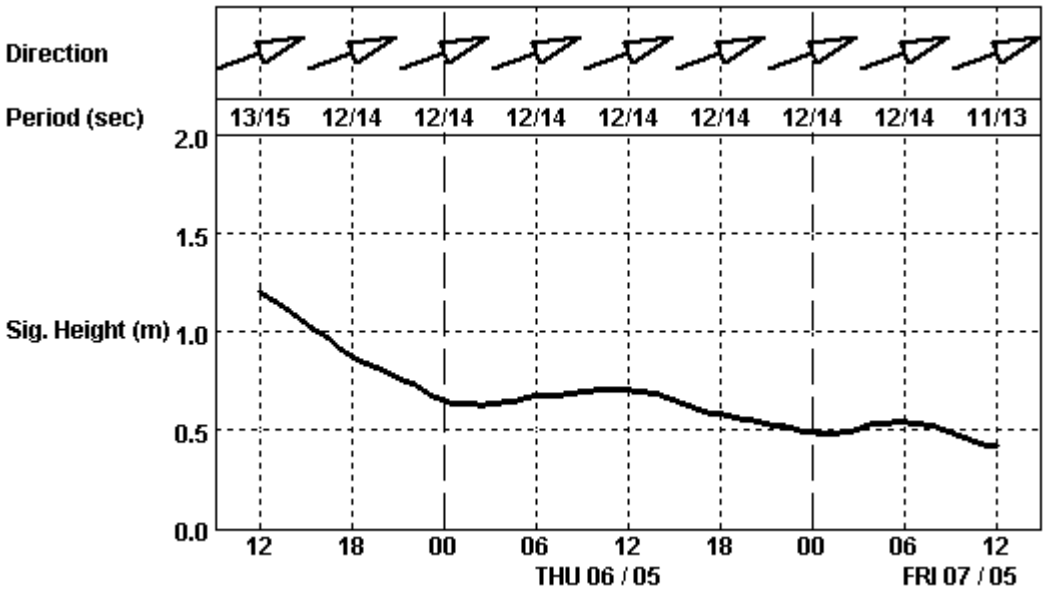
WOODSIDE
AUSTRALIAN ENERGY



Weather forecast for Legendre area from SSU

5th May 2004

Forecast wind strengths



Forecast sea state

Conditions were OK at the time of the incident

Sequence of Events

Port Fairlead Post Incident

- Attempted to position rig but port fairlead failed when the rig was close to final location
- Minor contact occurred between rig spudcan and platform mat before the could be pulled away from platform
- Pulled rig off to a holding point and pinned
- Replaced both fairleads and port anchor wire
- Positioned rig within tolerance

The port fairlead:

- Failure point was the shaft or barrel
- Anchor wire did not part
- Anchor wire was replaced

The Starboard fairlead:

- Did not fail in service
- Was replaced post incident
- Anchor wire was not replaced but only 6 months old


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
1
2
3
4
E 469423.9
N 7821218.1
Grid size: 20.0 m
GNS Time: 5-May-04 06:31:38
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469468.57
N: 7821259.46
Lat: 19°42'14.006"S
Lng: 116°42'31.208"E
THdg: 314.9 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 1.19m
Brg(T): 207.7 °T
Massive Tide
E: 469291.66
N: 7821446.21
THdg: 320.8 °T
Speed: 0.0 kts
Replay Control
Current file:
Files
C:\P0043
Record 696 out of 21273
06:31:03 Ensco56 switching to primary position source
FIX
Ensco56
CAPS NUM SCRL OVR


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
1
2
3
GNS Time: 5-May-04 06:34:20
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469467.04
N: 7821259.87
Lat: 19°42'13.992"S
Lng: 116°42'31.156"E
THdg: 315.7 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 1.76m
Brg(T): 146.2 °T
Massive Tide
E: 469291.93
N: 7821446.20
THdg: 329.5 °T
Speed: 0.3 kts
Replay Control
Current file:
Files
C:\P0043
Record 3817 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
N
FIX
Ensco56
CAPS NUM SCRL OVR


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
3
GNS Time: 5-May-04 06:36:28
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469474.92
N: 7821261.49
Lat: 19°42'13.940"S
Lng: 116°42'31.427"E
THdg: 312.7 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 7.56m
Brg(T): 246.1 °T
Massive Tide
E: 469295.76
N: 7821451.17
THdg: 336.8 °T
Speed: 0.2 kts
Replay Control
Current file:
Files
C:\P0043
Record 6118 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
06:35:44 PC clock synchronised to UTC time
FIX
Ensco56
CAPS NUM SCRL OVR


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
3
GNS Time: 5-May-04 06:37:02
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469476.11
N: 7821262.06
Lat: 19°42'13.921"S
Lng: 116°42'31.467"E
THdg: 314.8 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 8.88m
Brg(T): 245.8 °T
Massive Tide
E: 469308.29
N: 7821465.68
THdg: 325.9 °T
Speed: 0.7 kts
Replay Control
Current file:
Files
C:\P0043
Record 6904 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
N
06:36:39 PC clock synchronised to UTC time
FIX
Ensco56
CAPS NUM SCRL OVR


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
3
2
1
GNS Time: 5-May-04 06:37:45
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469477.13
N: 7821262.20
Lat: 19°42'13.917"S
Lng: 116°42'31.503"E
THdg: 318.6 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 9.87m
Brg(T): 247.5 °T
Massive Tide
E: 469310.27
N: 7821466.66
THdg: 336.0 °T
Speed: 0.0 kts
Replay Control
Current file:
Files
C:\P0043
Record 8022 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
N
06:37:57 PC clock synchronised to UTC time
FIX
Ensco56
CAPS NUM SCRL OVR

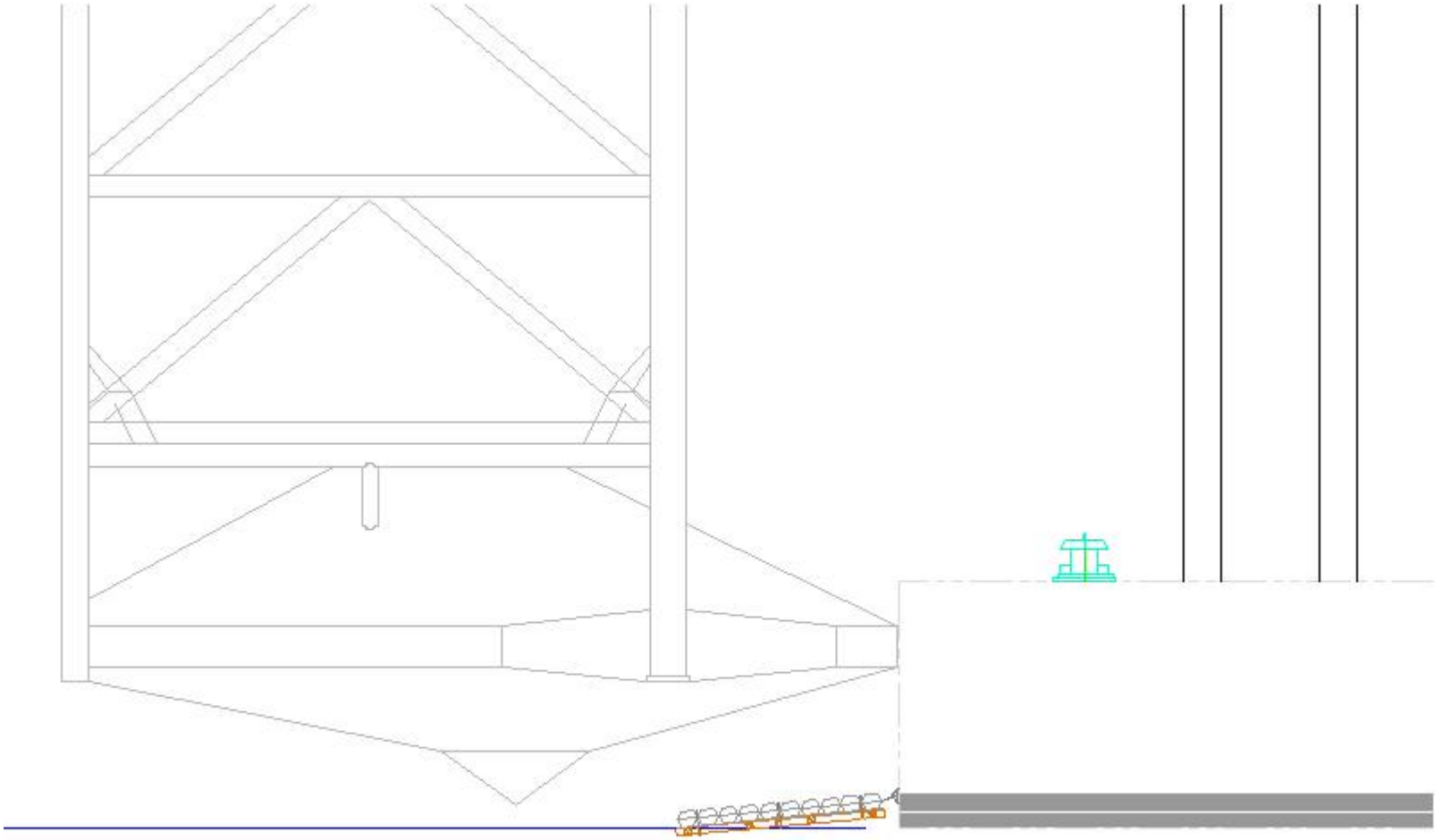

File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
GNS Time: 5-May-04 06:38:15
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469477.42
N: 7821260.76
Lat: 19°42'13.964"S
Lng: 116°42'31.512"E
THdg: 322.4 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 9.69m
Brg(T): 256.1 °T
Massive Tide
E: 469312.14
N: 7821464.40
THdg: 334.1 °T
Speed: 0.0 kts
Replay Control
Current file:
Files
C:\P0043
Record 8383 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
06:38:00 Massive Tide switching to primary heading source
FIX
Ensco56
CAPS NUM SCRL OVR


File Setup Mobile System Control Kbd Comps View Window Help
Plan
I Beam
Legendre
3
2
1
GNS Time: 5-May-04 06:40:29
Ensco56
Posn Src Name: T4 Thales UKOOA
Posn Src: Primary
Trk Offset: Datum
E: 469485.20
N: 7821282.88
Lat: 19°42'13.245"S
Lng: 116°42'31.781"E
THdg: 324.4 °T
TCMG: 0.1 °T
Speed: ??? kts
Legendre
Target E: 469468.02
Target N: 7821258.41
Rng(S): 29.91m
Brg(T): 215.2 °T
Massive Tide
E: 469319.39
N: 7821487.64
THdg: 331.0 °T
Speed: 0.5 kts
Replay Control
Current file:
Files
C:\P0043
Record 11184 out of 21273
E 469413.9
N 7821212.1
Grid size: 20.0 m
N
06:40:03 PC clock synchronised to UTC time
FIX
Ensco56
CAPS NUM SCRL OVR

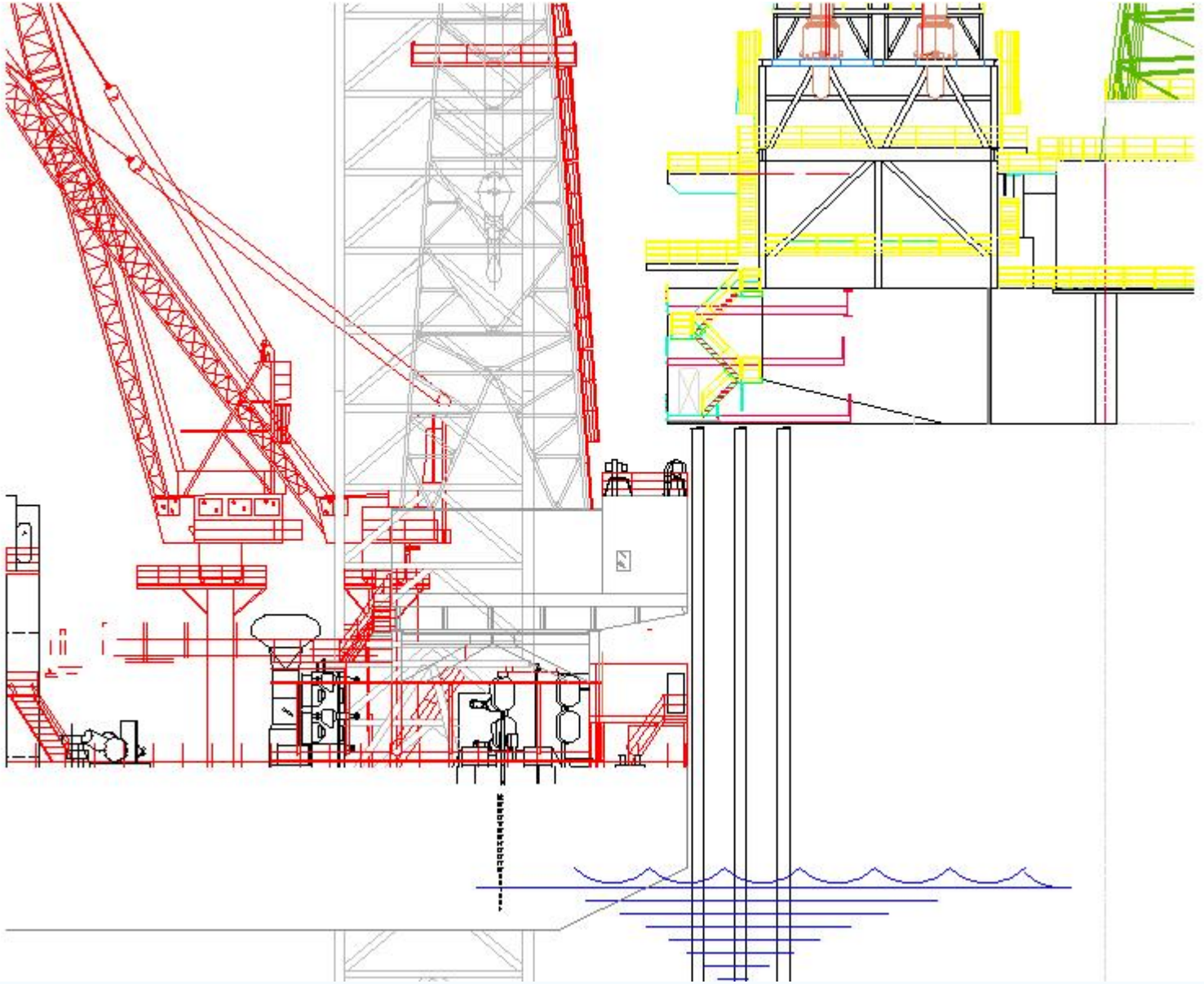
What Went Wrong

- **Anchor wire failure** – No excuse for this. The failure point was near the end, hard to reach and lubricate and not adequately checked. Many people could have identified a problem but nobody did.

- **Fairlead failure** –The fairlead was the weak link in the mooring system. It was tested with a proof load of 40 tons but the exact manufacturers SWL was unknown. There was some evidence of a pre existing crack in the fairlead shaft that broke. Rig inspections failed to identify the fairleads as weak points in the system. A fracture of the shaft would only have been identified if the fairlead was stripped down for inspection. The fairleads may not be original equipment but may have been replaced by previous owners. There is no document trail to cover pre Ensco equipment modifications.
- **Minor contact with Ocean Legend mat** – Spudcan to mat contact was minimal but not intended.



Positioning Ensco 56 adjacent to Ocean Legend



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LEGENDRE

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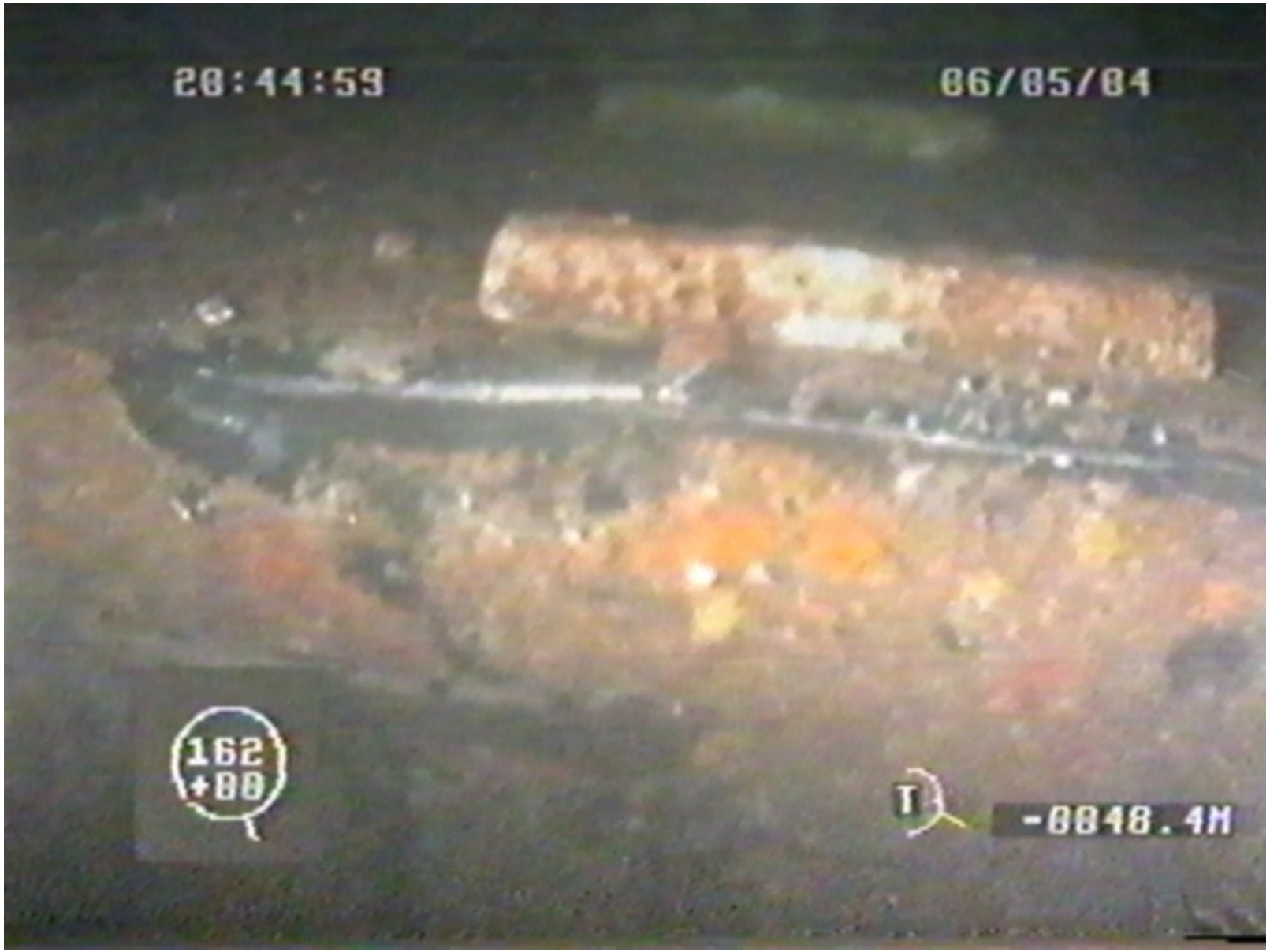
WOODSIDE
AUSTRALIAN ENERGY



LEGENDRE

Positioning Ensco 56 adjacent to Ocean Legend

WOODSIDE
AUSTRALIAN ENERGY

LEGENDRE

Positioning Ensco 56 adjacent to Ocean Legend

WOODSIDE
AUSTRALIAN ENERGY

Factors Contributing To A Successful Incident

- Pre move meeting in Perth at the planning stage
  - Rig move plan agreed
  - Anchor spread and configuration agreed
  - Survey equipment spread agreed
  - Workboat manning levels agreed
  - Tug selection agreed

Factors Contributing To A Successful Incident

- SIMOPS plan defined pre move criteria
- Anchors pre set and load tested about one week prior to rig arrival
- Tow master generated plan based on pre rig move meeting
- Ensco insurance underwriter reviewed and agreed to rig move plan

Factors Contributing To A Successful Incident

- In field pre move meeting held as per rig move plan
- Experience of senior crew at this sort of rig move
  - Tow Master well experienced including jack up to platform moves with Ensco 56
  - Ensco personnel well experienced
  - Ensco rig manager in attendance
  - Work boat masters well experienced
  - Surveyors well experienced
  - Drilling Supervisors well experienced

Factors Contributing To A Successful Incident

- Contingency plans were prepared and in this case executed
- The incident investigation was thorough and identified some shortcomings which were worked upon without delay

Outcomes & The Future

- Equipment failures – Ensco have re engineered the equipment specification and replaced the fairleads
- Maintenance – Ensco has increased the maintenance requirements in their preventative maintenance system for mooring system components
- A detailed incident report was issued

What Changes For Next Time

- Improve pre job equipment inspection
- No change to planning – plan was OK
- No change to people – people were OK
- No change to execution – execution was OK

Questions