KEMENTERIAN PERHUBUNGAN

BADAN PENGEMBANGAN SDM PERHUBUNGAN

SEKOLAH TINGGI ILMU PELAYARAN

M A K A L A H

OPTIMALISASI KEMAMPUAN OPERATOR DP SISTEM DI ATAS MV.DEEPWATER ASGARD GUNA MENDUKUNG KEGIATAN PENGEBORAN MINYAK LEPAS PANTAI

Oleh :

M A S D U K I, S.ST.Pi

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PROGRAM PENDIDIKAN DIKLAT PELAUT-I

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KATA PENGANTAR

Alhamdulillah Puji syukur penulis panjatkan kehadirat Alloh SWT atas rahmat dan karunia yang telah dilimpahkan sehingga penulis dapat menyelesaikan makalah ini dengan judul : **"Optimalisasi Kemampuan Operator DP Sistem di Atas MV. Deepwater Asgard Guna Mendukung Kegiatan Pengeboran Minyak Lepas Pantai",** sebagai persyaratan untuk memenuhi Kurikulum Program Upgrading ANT-I yang diselenggarakan di Sekolah Tinggi llmu Pelayaran (STIP) Jakarta.

Penulis menyadari akan keterbatasan waktu dan kemampuan di dalam penyusunan kertas makalah ini, sehingga masih banyak kekurangan dan hasilnya belum sempurna. Oleh karena itu penulis membukakan diri untuk menerima kritik dan saran-saran yang bersifat positif guna perbaikan makalah ini.

Pada kesempatan ini penulis mengucapkan terima kasih kepada semua pihak yang telah membantu, sehingga makalah ini dapat terwujud terutama kepada yang terhormat :

1. Capt. Marihot Simanjuntak, M.M, selaku Ketua Sekolah Tinggi Ilmu Pelayaran (STIP) Jakarta.
2. Capt. Suhartini, S.SiT., M.M.Tr, selaku Ketua Program Studi Nautika Sekolah Tinggi Ilmu Pelayaran Jakarta.
3. Ibu Vidya Selasdini, M.M.Tr, selaku Kepala Devisi Pengembangan Usaha.
4. Capt. Aldrin Dalimunte, M.M, selaku Dosen Pembimbing Materi.
5. Bapak Asman Ala, ST., MT. selaku Pembimbing Penulisan
6. Seluruh rekan-rekan Perwira Siswa ANT-I angkatan 52 dan semua pihak yang tidak dapat disebutkan satu persatu yang telah membantu.

Akhir kata, semoga makalah ini dapat membawa manfaat bagi penulis dan para pembaca yang berkenan membacanya.

Jakarta, Juni 2019

Penulis

MASDUKI, S.ST.Pi

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DAFTAR ISI

BAB I

PENDAHULUAN

A. LATAR BELAKANG

Dalam satu dasawarsa terakhir ini, eksplorasi sumber daya alam mineral, khususnya Minyak dan Gas (MIGAS) telah mengalami peningkatan yang sangat pesat. Hal tersebut guna pemenuhan akan energi dunia yang meningkat tajam, seiring meningkatnya industri pertumbuhan sosial ekonomi masyarakat dunia serta pencapaian teknologi yang memudahkan kehidupan manusia.

Eksplorasi sumber daya Minyak dan Gas (MIGAS) yang ada didaratan saat ini telah mencapai hampir pada titik maksimal sehingga pilihan selanjutnya adalah eksplorasi di lautan. Kita ketahui bahwa teknologi eksplorasi minyak lepas pantai dewasa ini telah berkembang sangat pesat jika disbanding dengan teknologi konvensional yang digunakan pada masa-masa awal eksplorasi minyak. Ada banyak jenis unit alat pengeboran minyak lepas pantai seperti Jack Up rig, Semi sub rig, dan Drill ship.

Drillship adalah sebuah kapal yang telah dilengkapi dengan peralatan khusus yang mampu melakukan eksplorasi minyak dan gas bumi. Dari desain pada umumnya tidak jauh berbeda dengan kapal niaga namun ada yang mudah untuk membedakan dari kapal *Drillship* dengan kapal niaga yaitu adanya tower atau menara untuk melakukan pengeboran, tinggi menara tersebut bisa mencapai ketinggian 80 meter dari atas geladak. MV. DEEPWATER ASGARD adalah kapal yang pernah Penulis awaki dan kapal ini adalah jenis *Drillship* terbaru "Generasi ke-6" yang dibuat pada tahun 2014 di *DSME Shipyard* Korea Selatan. Kapal ini digunakan utnuk aktifitas drilling atau pengeboran di laut dalam. Seperti dalam kegiatan pengeboran yang penulis ikuti yaitu proyek pengeboran

minyak di selat makassar dengan kedalaman laut mencapai 1500 meter. Ada banyak pengembangan teknologi pada kapal ini diantaranya adalah *BOP (Blow Out Preventer)*, desain kapal, *DP-System*, dan lain-lain. Kapasitas crew di kapal ini dengan maximum 200 orang. *Drillship* ini juga bisa digunakan sebagai *platform* untuk melaksanakan pekerjaan pemeliharaan atau penyelesaian seperti *casing* dan instalasi - instalasi tubing atau pekerjaan bawah laut lainnya.

Drillship prinsipnya dibagi dua kategori untuk perairan dalam dan perairan *ultra deepwater*. Posisi kapal dikontrol oleh sistem *thruster* berpengendali komputer dengan system positioning dinamis yang berteknologi tinggi dimana memiliki setidaknya memiliki lima *position refrence* untuk data posisi dan memiliki enam generator utama yang masing-masing dua generator di pisahkan oleh sekat anti kebakaran dan tergenang. MV.Deepwater Asgard tempat penulis bekerja sebagai *Dynamic Positioning Operator* (DPO) merupakan kapal *drillship* yang dioperasikan sebagai kapal *Ultra deepwater Drillship* milik perusahaan pengeboran asal USA yaitu TransOcean.

Sistem *Dynamic Positioning (DP)* adalah sebuah alat kontrol dengan menggunakan komputer yang digunakan untuk dapat mempertahankan posisi kapal beserta haluannya dengan menggunakan baling-baling atau propeller sebagai penggerak utamanya *(main thrusters)* dan baling-baling atau propeller penggerak bantu samping *(side thrusters)* serta sensor-sensor bantu penentu posisi dikombinasikan dengan sensor-sensor penentu arah kecepatan angin, sensor-sensor gerak dan penentu arah yang masing-masing membaca dan memberikan informasi dalam bahasa komputer yang kemudian akan diterjemahkan dalam respon mekanik terhadapa unit penggerak sehingga dapat memposisikan kapal pada posisi tertentu yang dikehendaki dimana besaran gaya atau tenaga yang dikeluarkan akan sebanding dengan besarnya gaya dari luar terhadap kapal.

Pertama kali sistem *Dynamic Positioning (DP)* digunakan pada tahun 1957 dalam proyek *Ivfohole* oleh Amerika. Tujuan dari proyek ini sendiri adalah untuk mengebor kedalam lapisan bumi yang disebut *"Moho",* yang merupakan lapisan terluar dari kulit bumi. Keberhasilan pada pengeboran ini membuktikan bahwa lempengan kulit bumi mana yang paling tipis dan samudera mana yang paling dalam. Kedalaman yang dicapai sekitar 4500 meter dan ini jauh lebih dalam dari sistem konvensional dengan jangkar biasa.

BAB II

LANDASAN TEORI

A. TINJAUAN PUSTAKA

Dalam penulisan makalah ini penulis mengambil landasan teori berkaitan dengan judul yang diambil tentang:

1. Optimalisasi

a. Menurut Kamus Besar Bahasa Indonesia (Depdikbud : 1995 : 628) optimalisasi berasal dari kata Optimal yang berarti terbaik, tertinggi. Optimalisasi adalah hasil yang dicapai sesuai dengan keinginan, jadi optimalisasi merupakah pencapaian hasil sesuai harapan secara efektif dan efisien.

b. Menurut Winardi (1996 : 363) Optimalisasi adalah pencarian nilai terbaik dari yang tersedia dari berbagai fungsi yang diberikan pada suatu konteks. Optimalisasi banyak juga diartikan sebagai ukuran dimana semua kebutuhan dapat dipenuhi dari kegiatan-kegiatan yang dilaksanakan.

2. Kinerja

Menurut Veithzal Rivai dan Ahmad Fawzi Mohd, MBA (2005: 58), bahwa kinerja adalah hasil atau tingkat keberhasilan seseorang secara keseluruhan selama periode tertentu di dalam melaksanakan tugas dibandingkan dengan berbagai kemungkinan, seperti standar hasil kerja, target atau sasaran atau kriteria yang telah ditentukan terlebih dahulu dan telah disepakati bersama. Kinerja seorang karyawan dalam sebuah perusahaan sangat dibutuhkan untuk mencapai prestasi kerjabagi karyawan itu sendiri dan juga untuk keberhasilan perusahaan.

Istilah kinerja berasal dari *job performance* atau *actual performance* (prestasi kerja atau prestasi sesungguhnya yang dicapai oleh seseorang), atau juga hasil kerja secara kualitas dan kuantitas yang ingin dicapai oleh seorang pegawai dalam melaksanakan tugasnya sesuai dengan tanggung jawab yang diberikan kepadanya. (Anwar Prabu Mangkunegara 2007 : 67).

3. Pengeboran Minyak Lepas Pantai

Menurut Widjajono Partowidagdo (2004:102), pengeboran minyak lepas pantai adalah suatu kegiatan eksplorasi ke dalam reservoir bawah tanah atau dasar laut untuk memperoleh minyak, gas bumi, atau deposit mineral bawah tanah. Adapun jenis-jenis rig yang digunakan dalam kegiatan eksplorasi minyal di lepas pantai adalah sebagai berikut :

a) *Jack Up Rig* : Satu unit alat pengeboran dengan kaki yang panjang. Kaki ini dapat naik dan turun untuk menopang struktur utama. Biasanya kaki rig ini berjumlah empat buah. RIG jenis ini biasa digunakan pada daerah dengan kedalaman sekitar 100 M atau kurang.
b) *Tender RIG* : Sistem pengeboran dipasang pada platform. Tender RIG digunakan untuk membantu operasi pengeboran (pengangkatan pipa, struktur dll). Tender RIG akan menempel di platform saat operasi pengeboran berlangsung. Rig jenis ini ada yang dilengkapi dengan propeller sehingga bisa berpindah tempat secara mandiri. Ada pula yang tidak dilengkapi .
c) *Semi-submersible RIG* : Sesuai namanya, RIG semi-sub merupakan anjungan terapung yang dipasang alat pengeboran. Biasa digunakan untuk mengebor daerah laut dalam (lebih dari 100 M).
d) *Drillship* : Semua peralatan untuk pengeboran dipasang pada kapal. Digunakan untuk mengebor laut yang sangat dalam.

4. Operational Checklist

Menurut *DP Operation Manual MV.Deepwater Asgard* (2013:244) *Operational Checklist* atau daftar periksa operasional adalah salah satu alat observasi, yang ditujukan untuk memperoleh data, berbentuk daftar berisi faktor-faktor berikut subjek yang ingin diamati oleh observer, di mana observer dalam pelaksanaan observasi di lapangan tinggal memberi tanda **check** (**cek**, atau biasanya

dicentang) pada **list** faktor-faktor sesuai perilaku subyek yang muncul di lembar observasi sehingga memunginkan observer dapat melakukan tugasnya seara cepat dan obyektif. *Checklist* merupakan suatu pencatatan yang bersifat sangat selektif karena berisi suatu daftar kriteria yang spesifik.

Dalam pengoperasian sistem DP di MV.Deepwater Asgard, ada banyak kegiatan yang dipandu dengan berbagai macam *checklist*, diantaranya adalah beberapa *checklist* yang berkaitan dengan tugas seorang *DP-Operator* sebagai berikut:

a. Port Pre arrival/Departure Checklist
b. New field arrival Checklist
c. Departing well site Checklist
d. DP Alert condition checklist
e. 6 Hourly Checklist
f. 500 meter Checklist
g. Operation Safety Checklist
h. *Emergency Response Checklist*

Checklist-checklist tersebut diatas penulis lampirkan dalam lampiran no.7.

5. Sistem *Dynamic Positioning (DP)*

Menurut Andrea Mare (2009:42), sistem *Dynamic Positioning (DP)* bisa didefinisikan sebagai sebuah sistem yang secara otomatis mengontrol kapal untuk mempertahankan haluan dan posisinya dengan menggunakan *thrusters* aktif. Pada saat ini sistem DP banyak diterapkan dikapal-kapal yang digunakan untuk kegiatan eksplorasi lepas pantai. Dikarenakan sekarang kegiatan eksplorasi lepas pantai semakin bergerak kearah laut dalam, maka penggunaan rig konvensional menggunakan jangkar menjadi tidak efektif dan semakin mahal. Untuk itu penggunaan Sistem DP menjadi sebuah metode yang paling cocok saat ini.

6.* Operator *Dynamic Positioning (DP)

Menurut Bray (2008:19), *Dynamic Positioning Operator* atau operator DP adalah seorang yang telah mendapatkan pelatihan khusus dalam pengoperasian *Dynamic Positioning (DP)* sistem dan memiliki kualifikasi dan dibuktikan

dengan sertifikasi yang dikeluarkan oleh institusi resmi yang berbasis di London *"Nautical Institute"*.

Adapun kualifikasi *DP-Operator* tersebut adalah meliputi hal-hal berikut ini:

a. Pengendalian kapal dengan menggunakan kontrol manual, kontrol *Joystick* dan mode *Dynamic Positioning (DP)*. Serta perpindahan antar kontrol-kontrol tersebut.
b. Pemahaman secara menyeluruh tentang sistem *Dynamic Positioning (DP)* yang terpasang di atas kapal termasuk kemampuan fungsi operasi pada seluruh panel-panel pada unit *Dynamic Positioning (DP).*
c. Pengelolaan setting awal peralatan sistem *Dynamic Positioning (DP).*
d. Keterampilan pemakaian sistem masukan data cadangan jika dalam bahaya yang dihadapi oleh kapal.
e. Pemahaman sistem pengaturan sumber daya cadangan jika dalam bahaya termasuk peralatan redundansinya.
f. Pemahaman fungsi operasi FMEA (*Failure Mode Effect Analysist*)
g. Pemahaman observasi cuaca, keadaan laut, arus, ombak dan kondisi alam lainnya sehubungan dengan penempatan kapal terutama haluan kapal.

7. Kapal *Dynamic Positioning (DP)* menurut kelasnya

Menurut IMO MSC/ CIRC 645 terdapat pedoman untuk kapal-kapal dengan DP system. Pengelompokan peralatan untuk DP system di definisikan berdasarkan *WCF (worst case failure)* dibagi atas tiga kelas yakni :

a. Kapal *Dynamic Positioning (DP)* kelas 1 adalah kapal *Dynamic Positioning (DP)* yang hanya memiliki sebuah komputer sebagai pusat pengolahan input data, yang mana *loss control* dapat terjadi dari kegagalan tunggal *(single failure)* dan kapal tidak dapat mempertahankan posisinya.
b. Kapal *Dynamic Positioning (DP)* kelas 2 adalah kapal *Dynamic Positioning (DP)* yang memiliki sistem satu cadangan *(redundancy)* terhadap seluruh peralatan sehingga jika terjadi kegagalan tunggal *(single failure)* pada sebuah peralatan yang sedang aktif, tidak menyebabkan *loss control* dalam menahan posisi kapal. Kehilangan posisi kapal jarang terjadi walaupun di saat terjadi kerusakan atau kegagalan tunggal yang mungkin terjadi pada salah satu peralatan yang sedang aktif atau sistem yang aktif.

Kriteria *Single failure* antara lain,

- Komponen aktif tunggal atau sistem seperti *thruster*, generator, katub kontrol remot, dan lain lain.
- Berbagai komponen tetap normal seperti kabel, pipa, katub manual, dan lain lain.

c. Kapal *Dynamic Positioning (DP)* kelas 3 adalah kapal *Dynamic Positioning (DP)* yang memiliki sistem lebih dari satu cadangan *(Redundancy)* sehingga kemampuannya selain seperti dalam kapal *Dynamic Positioning (DP)* 2 juga termasuk jika kapal dalam keadaan kebakaran atau terjadi banjir atau terendam pada salah satu komponennya, kapal tetap dapat mempertahankan posisinya. Pada jenis kapal DP kelas 3, *Single failure* meliputi :

- Item yang terdapat pada di atas untuk kelas 2 dan normal komponen tetap yang mungkin di asumsikan untuk gagal.
- Semua komponen harus dilindungi oleh suatu kompartmen atau ruangan yang tahan dari air atau api.

Pada kelas 3 memiliki komponen antara lain,

- DP kontrol pokok 2 set.
- Back up sistem kontrol DP 1 set.
- Sistem independent joystick.
- PRS 3 set/ 1 set
- Sensor-sensor
  - Gyro 2+1
  - VRU 2+1
  - Wind 2+1
- UPS 2+1

8. Peralatan atau Komponen *Dynamic Positioning* (DP) System

Menurut Alstom (2000:55-98) dalam buku *Guide to Dynamic Positioning of Vessel*, beberapa pengertian yang berkaitan dengan sistem DP sebagai berikut :

a. Komputer dan Controllers *(Operation Station)*

Pada pengoperasian Dynamic Positioning (DP) semua pengaturan dan pelaksanaan operasi Dynamic Positioning (DP) adalah pada Console *Station* Operator System merupakan MMI *(Man Machine Interface)* dalam melakukan pengoperasian kapal dengan menggunakan Dynamic Positioning (DP) ini. Dalam unit ini ditunjukkan semua indikasi dari masing-masing sensor, sistem referensi penggunaan thruster dan besarannya, peringatan-

BAB III

ANALISIS DAN PEMBAHASAN

A. DESKRIPSI DATA

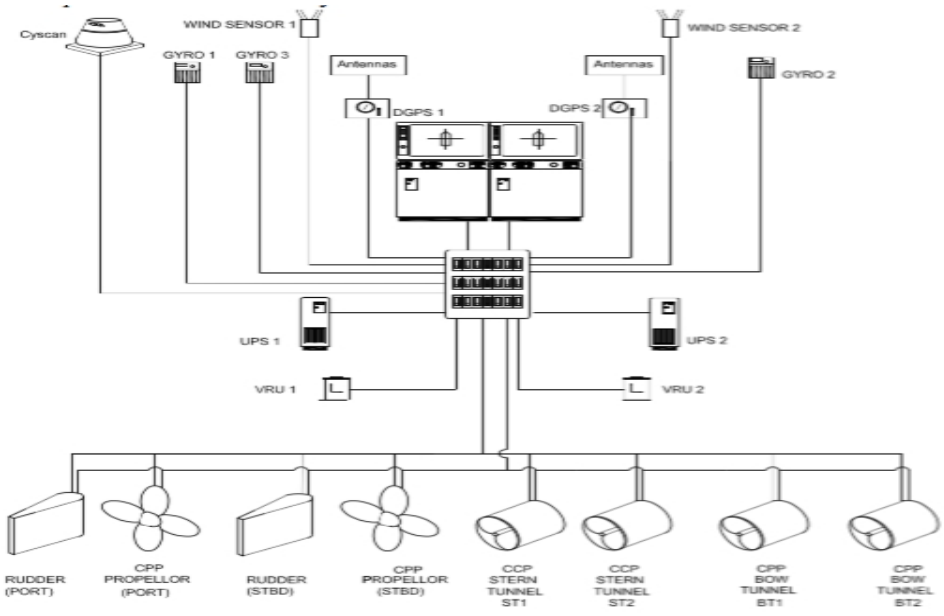
TransOcean adalah sebuah perusahaan Drilling Service yang berkantor pusat di Houston-Texas, USA. Salah satu kapal milik oleh TransOcean adalah DEEPWATER ASGARD dimana penulis bekerja sebagai DP operator. Kapal yang diregister di Marshall Island ini merupakan jenis *Ultra Deepwater DrillShip* dibuat pada tahun 2014 oleh DSME Shipyard Korea Selatan, dilengkapi dengan sistem DP kelas-3 merk Kongsberg. (untuk spesifikasi kapal lebih lengkap, penulis melampirkan datanya pada lampiran no.1).

Kapal DEEPWATER ASGARD di charter oleh Perusahaan Chevron untuk melakukan kegiatan pengeboran di selat makassar sejak awal 2014 dalam proyek IDD (Indonesian Deepwater Development). Dalam kegiatan proyek ini dimana lokasinya ditengah laut dengan kondisi kedalaman laut mencapai 1500 meter, cuaca yang sering berubah dan arus selat yang kencang, maka tidak memungkinkan melakukan pengeboran menggunakan rig konvensional. Teknologi yang ada pada kapal DEPWATER ASGARD sangat mampu untuk melakukan pegeboran ini karena sesuai dengan desain kapalnya. Namun keberhasilan kegiatan pengeboran ini juga sangat ditentukan oleh SDM yang mengoperasikan kapal ini. Ada sangat banyak SDM dari berbagai bidang keahlian yang bekerja dikapal ini. Mereka semua dituntut untuk professional dan berdisiplin tinggi pada bidangnya masing-masing. Salah satu SDM terpenting di kapal ini adalah DP Operator.

Pekerjaan di atas kapal penuh dengan tantangan dan berbahaya, namun jika semua pekerjaan sesuai dengan prosedur maka hal-hal tersebut dapat dicegah, oleh sebab itu untuk telah banyak perusahaan-perusahaan yang bergerak di bidang pengeboran lepas pantai melengkapi kapalnya dengan sistem *Dynamic Positioning*

yang mana sistem tersebut dapat berolah gerak secara akurat, cepat, tepat dan aman secara maksimal, guna menghemat waktu dan keterlambatan dalam pengoperasian.

Prinsip kerja dari sistem *Dynamic Positioning* ini adalah sistem yang dikontrol oleh komputer secara otomatis dan dapat mempertahankan posisi kapal dengan menggunakan baling-baling utama (*Propeller*) dan baling-baling bantu depan maupun yang belakang (*bow and stern thruster*) dan penentuan dari posisi kapal dapat digunakan dengan cara menggunakan beberapa referensi yaitu dengan menggunakan sistem *Position Reference System* (PRS)*, gyro* kompas, sensor angin (*anemometer)*. Alat-alat tersebut dihubungkan dengan komputer yang mana bekerja menghitung dengan akurat sehingga posisi kapal dapat dipertahankan pada posisi yang kita inginkan. Dengan demikian pekerjaan menjadi lebih mudah dikerjakan di atas permukaan laut baik laut yang dangkal maupun yang dalam, sehingga dapat memberikan hasil yang optimal tanpa harus menggunakan jangkar atau diikat dengan tali untuk menahan posisi kapal.



Gambar 11.Sistim Kerja kapal DP

Saat ini kapal yang dilengkapi sistem DP khususnya untuk kapal-kapal pengeboran minyak lepas pantai masih sering menemui kendala dan hambatan yang mempengaruhi kelancaran operasi sehingga hasil kerja kurang optimal. Dari dasar inilah penulis tertarik untuk mengangkat judul yang berhubungan dengan upaya peningkatan kinerja *DP* operator pada kapal yang menggunakan sistem DP.

Dalam pengoperasian DP sistem peran DP operator sangat besar dan merupakan kunci optimal atau tidaknya DP sistem tersebut. Tugas dan tanggung jawabnya sangat besar, dan hanya boleh dilakukan oleh orang telah memiliki sertifikat, karena dianggap telah berpengalaman, mempunyai kompetensi dan kualifikasi terhadap DP sistem itu sendiri. Dalam hal ini kurangnya keterampilan *Dynamic Positioning Operator* dalam pengoperasian alat serta kurang familiar atas hal-hal yang baru ditemui oleh seorang operator dengan keadaan sekitar, misalnya: faktor dari luar dari alam yaitu cuaca (arus, alun yang tinggi, ombak tinggi, angin kencang), dengan referensi sistem *Dynamic Positioning* itu sendiri dan faktor dari dalam yaitu kapal itu sendiri dimana kapal tersebut masing-masing mempunyai karakter tersendiri dan sistem *Dynamic Positioning* contohnya pada tampilan *console screen* atau layarnya, juga dari persiapan yang kurang dari seorang operator misalnya sistem ini diaktifkan bila kapal akan mendekati well site ataupun *Platform* . *Dynamic Positioning Operator* akan melakukan *testing* sistem tersebut di luar area 500 meter sebelum memasuki area well site atau *Platform* yang disebut atau juga dikenal dengan kata *Dynamic Positioning Establish,* hal ini guna mencegah terjadinya kecelakaan bila ada sistem dari kapal tersebut tidak berfungsi dengan baik. Kapal bisa mengalami insiden yang tidak diinginkan karena kurangnya wawasan dan pengawasan dari *Dynamic Positioning Operator* dalam mengoperasikan sistem *Dynamic Positioning* dan hal ini kembali karena kurang terampilnya seorang *Dinamic Positioning Operator* dalam mengoperasikan sistem ini yang tentunya dapat mengakibatkan kerugian yang sangat besar ditanggung oleh perusahaan.

DP sistem ini selain mempunyai kelebihan juga mempunyai kelemahan sehingga seorang operator DP dituntut untuk lebih paham dalam menanganinya agar tidak terjadi hal-hal yang tidak diharapkan dan tidak terjadi kesalahan prosedur sebelum dan sesudah mengoperasikannya. Namun kenyataannya, penulis masih menemui kesalahan-kesalahan selama bekerja di atas kapal Deepwater Asgard yaitu *DP Operator* kurang menguasai *DP* sistem yang ada, selain itu juga kurangnya pemahaman akan pengaruh dari faktor-faktor dari luar tersebut. Beberapa contoh seperti di bawah ini yaitu :

a. Kesalah pahaman pengoperasian terhadap tombol-tombol yang ada di atas *DP Console* yang bisa mengakibatkan terganggunya proses pengeboran yang sedang berjalan.
b. Operator DP melupakan rencana untuk tindakan antisipasi (*Preventive action*) pencegahan bahaya yang akan terjadi secara tiba-tiba selama pengoperasian dengan *DP* sistem.
c. Efisiensi waktu menjadi lambat selama proses *DP system* berlangsung sehingga terjadi keterlambatan dalam pengoperasian kapal.

Dalam pengoperasian Sistem *Dynamic Positioning* yang baik diperlukan tahap-tahap yang mengikuti aturan manual dari sebelum, selama dan sesudah mengoperasikan sistem *Dynamic Positioning* ini oleh seorang *Dynamic Positioning Operator,* hal ini untuk memenuhi tuntutan keselamatan jiwa di laut, keselamatan kapal, penumpang beserta muatannya dan pencegahan polusi di laut. Hal ini memerlukan beberapa *Checklist* seperti *Pre-Dynamic Positioning Checklist* (daftar pengecekan sebelum mengoperasikan *Dynamic Positioning), Dynamic Positioning Operations procedure-6 hourly Checklist* (daftar pengecekan setiap per 6 jam), *Dynamie Positioning Operations Procedures-Engine Control Room Dynamic Positioning Checklist* (daftar pengecekan ruang control mesin). *Checklist* ini dibuat guna untuk mengingatkan kita akan tahap-tahap sebelum dan selama pengoperasian dengan sistem *Dynamic Positioning,* jika hal itu tidak dilakukan maka terkadang operator akan melupakan hal-hal yang penting untuk dipantau.

Dalam proses hal tersebut diatas maka penggunaan sistem *Dynamic Positioning* ini tentu saja dibutuhkan DP Operator yang disiplin, terlatih dan mempunyai pengetahuan tehnologi berkenaan juga semua prosedurnya secara baik dan benar. Selama pengoperasian *Dynamic Positioning* ada juga beberapa procedure dan *Checklist* yang harus diikuti selain yang telah dijelaskan diatas, yaitu sewaktu kapal akan memasuki area 500 meter (*Dynamic Positioning Operations Procedure - Field Entry 500 Metres Zone Checklist)*, DPO harus dapat memastikan bahwa proses pemindahan kendali *(Control Change Over)* dari *Manual Control* ke *Dynamic Positioning Control Mode* dan secara otomatis dapat berfungsi dan bekerja secara baik dengan cara melakukan *Pre-Test atau Dynamic Positioning Establish* melakukan prosedure tersebut diatas satu persatu, mengisi

Dynamic Positioning Checklist untuk mengetahui, mengingat dan memeriksa tahapan-tahapan yang perlu diperhatikan dalam pengoperasian *Dynamic Positioning.*

Beban tenaga yang digunakan terlalu berlebihan dari kapasitasnya (*Over Load)* menimbulkan mesin berhenti tiba-tiba dan tidak adanya ataupun lupa disiapkannya generator cadangan untuk mengantisipasi hal tersebut, atau lemahnya *DGPS (Diferencial Global Positioning System),* maka untuk hal tersebut diperlukannya *6 Hourly Checklist* yaitu pengecekan setiap 6 jam sekali. Pada tanggal 09 Oktober 2017 penulis pernah mengalami kejadian loss DP control pada saat dilakukan pemindahan unit station control dari Stasiun-1 ke stasiun-2 tiba-tiba generator power supply loss power waktu sehingga menyebabkan keterlambatan beberapa saat sampai unit stasiun-2 bisa dioperasikan. Keterlambatan itu menyebabkan thruster berhenti bekerja beberapa saat dan posisi kapal sedikit berubah dikarenakan kencangnya arus dari arah lambung kapal. Pergeseran kapal secara tiba-tiba itu menyebabkan aktifnya alarm peringatan bahaya di lokasi drill floor. Sehingga driller juga mengambil keputusan untuk menghentikan kegiatan operasi drilling sementara waktu. Sebagai langkah penanggulangan adalah sesegera dilakukan pemindahan power supply ke battery UPS dan mode otomatis DP dipindahkan ke mode manual menggunakan joystick untuk menjaga posisi kapal menahan kuatnya arus.

Selama pengoperasian berlangsung *Dynamic Positioning Operator* harus dapat memikirkan tindakan *Preventive* dengan melakukan pengecekan atau mengukur kemampuan kapal tersebut dalam mempertahankan posisi dan haluan di dalam keadaan cuaca yang berbeda-beda (*Capability Plots).* Salah satu keunggulan dan kecanggihan dari kapal *Dynamic Positioning ini* adalah mampu mempertahankan posisi dan haluannya setelah mengalami kehilangan signal *PRS (Position Reference System)* selama lebih kurang 15 menit tergantung keadaan sekitar kapal yaitu kekuatan arus dan angin , Hal ini dilakukan dengan bantuan daya ingat computer (*Computer Memory*) yang dirancang khusus untuk mampu melakukan hal tersebut dengan memberikan informasi dan perintah kepada semua baling-baling (*Propeller and Thruster).*

Hal-hal kesalahan dalam pengoperasian *Dynamic Positioning* akan diberitahukan kepada *Dynamic Positioning Operator* melalui peringatan-peringatan alarm yang muncul pada layar *Monitor Computer Dynamic Positioning,* bila hal tersebut terjadi dan *Dynamic Positioning Operator* lupa ataupun tidak tahu akan penanganannya, maka harus dengan cepat dan tanggap mempelajarinya melalui buku petunjuk manual tentang penjelasan penyebab dan tindakan yang harus diambil seorang *Dynamic Positioning Operator,* tentang hal ini dapat dilihat dalam buku *FMEA (Failure Modes and Effect Analysis)*. Alarm peringatan pada *DP System* dapat kita dengarkan dan lihat dengan jelas kita baca di layar *DP Console* dimana *alarm* itu memberikan kita peringatan akan adanya kesalahan yang akan terjadi maupun yang sedang terjadi dan laporan *alarm* itu pada layar komputer juga akan tercetak di printer *DP* itu sendiri secara otomatis.

Pesan *alarm* juga dapat kita kenali secara *audible, visual* dan alaram tersebut juga di rekam atau disimpan dalam *memory* komputer *DP System.* Sehingga peringatan-peringatan dan informasi yang ada dapat dengan mudah dilakukan investigasi dan tindakan untuk mencegah hal-hal yang tidak di inginkan.

Kesalahan (*failure*) tersebut di atas salah satu misalnya pada *wind sensor, sensor* tersebut bekerja dengan memperhitungkan kecepatan dan arah angin yang ditiupkan kepada kapal, dan *sensor* tersebut akan mengirimkan informasi ke *DP system* untuk dihitung agar posisi kapal dapat dipertahankan oleh *thruster* dan *propeller*. Jika saja ada helikopter *(chopper)* yang akan *landing* helipad*,* tetapi *DP Operator* tidak *disable wind sensor* (mematikan sensor angin) tersebut, maka ketika *chopper* yang akan *landing* di helipad tersebut akan mengalami perubahan arah maupun kecepatan angin yang sangat cepat, sehingga angin yang diterima oleh *anemometer* atau *wind sensor* akan diterima dan dikalkulasikan langsung oleh *DP System* sehingga kapal akan langsung bergerak dengan cepat sesuai perintah dari program *DP* untuk menambah kekuatan putaran agar posisi kapal tidak bergeser akibat dari faktor angin tersebut. Hal ini akan berbahaya karena kapal dapat bergerak sendiri dengan cepat dan akan menyebabkan terganggunya proses drilling. Prosedure selama keadaan darurat berlaku dan termasuk dari penanganannya.

Terkadang saat hal tersebut terjadi dan DP Operator melupakan tindakan apa yang harus diambil, hal itu dapat dihindari bila saja mereka melakukan operasi sesuai prosedur, karena kelalaian yang berlangsung lama dan kebiasaan, maka

sering sekali diabaikannya. Oleh sebab itu sebagai DP Operator harus sering memeriksa dan memastikan prosedur tersebut diatas dimana telah dilakukan dengan baik dan benar.

B. ANALISIS DATA

Dari beberapa uraian dan gambaran di atas yang penulis berikan pada bab-bab sebelumnya, maka penulis dapat mengindentifikasikan beberapa masalah dasar yang berpengaruh terhadap upaya meningkatkan kinerja *Dynamic Positioning Operator* di atas kapal Deepwater Asgard selama melakukan kegiatan operasi pengeboran minyak lepas pantai, beberapa masalah tersebut antara lain adalah :

1. Kurang optimalnya kemampuan operator DP dalam pengoperasian sistem *Dynamic Positioning (DP)* di atas kapal.

Seiring dengan meningkatnya jumlah kapal pengeboran *(Drillship)* maupun *OSV (Offshore Support Vessel)* yang dilengkapi dengan sistem *Dynamic Positioning*, perlu ditingkatkan pula sumber daya manusia yang profesional dalam pengoperasion teknologi tersebut. Berbagai tempat pelatihan DP *(DP training center)* dibuka sebagai wadah para perwira kapal dalam proses pelatihan dasar dan lanjutan guna mendapatkan sertifikat DP yang tentunya keberadaan tempat, pengajar serta alat-alat pendukungnya telah diakui oleh *Nautical Institute*, UK sebagai badan resmi yang mengeluarkan DP sertifikat dan *DPO Log Book.*

Untuk saat ini tempat pelatihan DP sudah ada di Indonesia, Singapura dan beberapa negara lain, misalnya : Malaysia, Filipina, India, Inggris, Amerika dan masih banyak lagi. Diperlukan 2 (dua) kali pembelajaran sebelum mendapatkan sertifikat DP penuh *(Full DP Certificate)* dan masa layar yang cukup bekerja diatas kapal DP. Yang pertama adalah pelatihan dasar DP *(Induction Course)*, sebelum mengikuti pelatihan dasar ini seorang calon DP Operator harus mengikuti ujian secara online yg dilakukan oleh *Nautical Institute* lebih dahulu, jika lulus baru dapat mengikuti pelatihan dasar DP namun bila gagal dalam ujian maka seorang calon DP Operator masih diberikan kesempatan dua kali untuk mengikuti ujian tersebut. Kesempatan

BAB IV
KESIMPULAN DAN SARAN

A. KESIMPULAN

Berdasarkan uraian pada bab-bab sebelumnya yang telah disampaikan, maka penulis mengambil kesimpulan sehubungan dengan permasalahan dalam optimalisasi kemampuan Operator *Dynamic Positioning* (DP) sebagai berikut :

1. Kurang optimalnya kemampuan Operator DP dalam pengoperasian sistem *Dynamic Positioning (DP)* di atas kapal disebabkan oleh belum maksimalnya penerapan SISPRO pengoperasian sistem DP diatas MV. Deepwater Asgard.
2. Kurang maksimalnya pemahaman operator DP tentang SISPRO pengoperasian DP di atas kapal, disebabkan oleh:
   a. Kurang maksimalnya familirisasi SISPRO pengoperasian sistem Dp di atas kapal
   b. Kurang maksimalnya latihan penggunaan sistem DP diatas kapal.

B. SARAN

1. Untuk mengoptimalkan kemampuan operator DP dalam mengoperasikan sistem DP di atas kapal di sarankan agar :
   a. Meningkatkan pelaksanaan latihan pengoperasian Sistem DP di atas kapal
   b. Meningkatkan motivasi Operator DP (ABK) dalam menerapkan SISPRO pengoperasian sistem DP di atas kapal.
2. Untuk memaksimalkan pemahaman operator DP tentang SISPRO pengoperasian sistem DP diatas kapal, disarankan kepada nakhoda agar :
   a. Memaksimalkan pelaksanaan familirisasi SISPRO pengopreasian sistem DP diatas kapal.
   b. Meningkatkan pelaksanaan safety meeting yang berkaitan dengan pengoperasian sistem DP di atas kapal.

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DAFTAR LAMPIRAN

PENJELASAN ISTILAH

AHTS	-	Anchor Handling and Tug Service
ASD	-	Azimuth Stern Drive
ABD	-	Azimuth Bow Drive
DGPS	-	Differential Global Positioning System
DP	-	Dynamic Positioning
DPO	-	Dynamic Positioning Operator
FMEA	-	Failure Modes and Effect Analysis
HP	-	Horse Power
HPR	-	Hydro-acoustic Position Reference
IMO	-	International Maritime Organization
IMCA	-	International Marine Contractor Association
LBL	-	Long Baseline System
MMI	-	Man Machine Interface
MRU	-	Motion Reference Unit
MV	-	Motor Vessel
OSV	-	Offshore Supply Vessel
PME	-	Position Measurement Equipment
POAC	-	Planning, Organizing, Actuating and Controlling
PRS	-	Position Reference System
PSV	-	Platform Supply Vessel
ROV	-	Remotely Operated Vehicle
SBL	-	Short Baseline System
SOLAS	-	Safety of Life at Sea
STCW	-	Standard of Training Certification and Watch-keeping
UPS	-	Un-interruptible Power Supply
VHF	-	Very High Frequency
VRU	-	Vessel Reference Unit

DAFTAR GAMBAR

Halaman

OPERATIONAL/SAFETY CHECKLIST
SOLAS 74/78

MONTH OF: _____

SHIP MAINTENANCE
CHECK LIST 1 – SAFETY MANAGEMENT SYSTEM

(APPLICABLE TO ALL VESSELS WITH A VALID SAFETY MANAGEMENT CERTIFICATE)

Ship's Name: O.N.:

Operator/Agent:

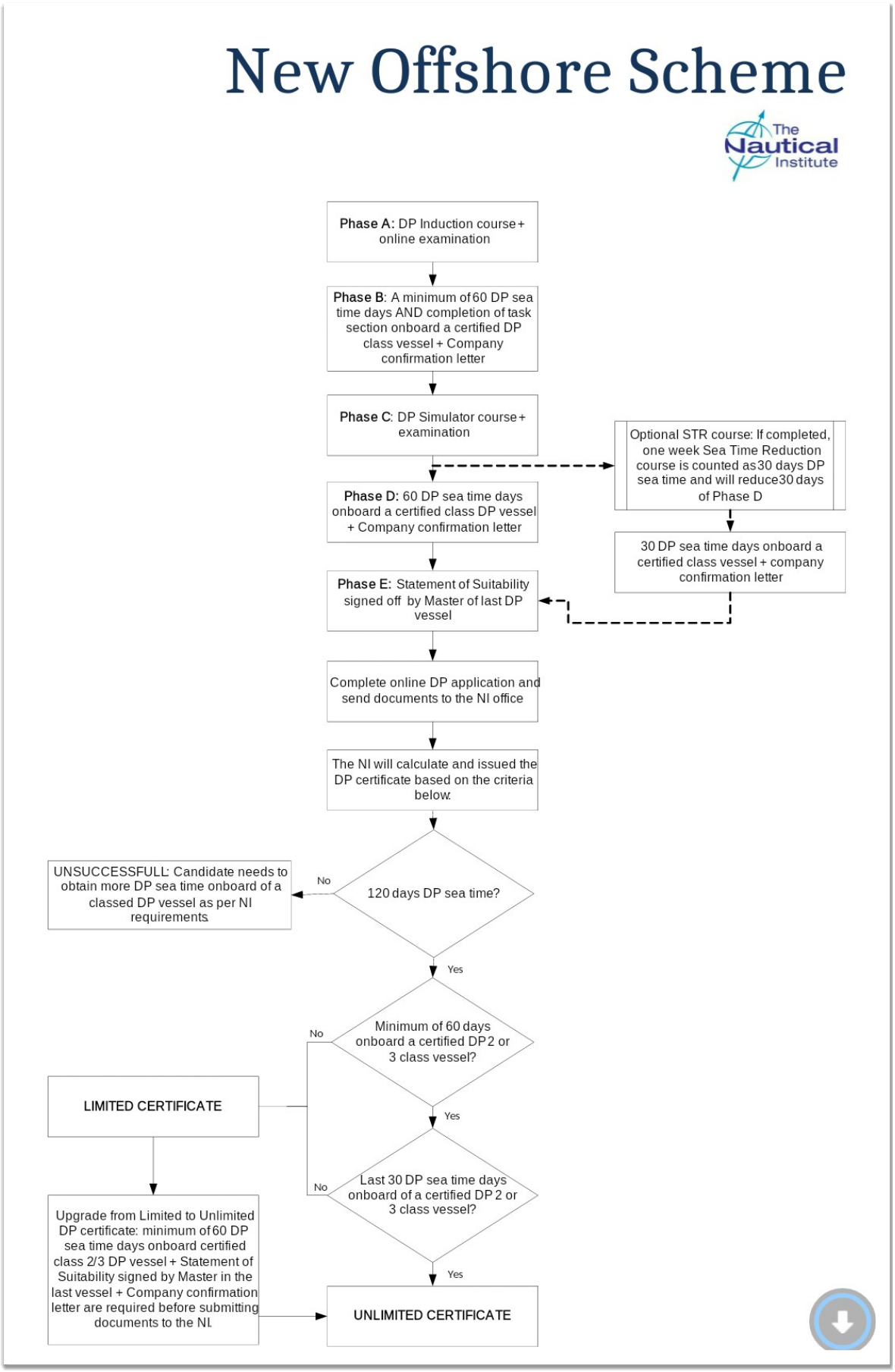
Master: Safety Officer:

	DATE OF REFERENCED AUDIT(S):					
ITEM	**SOLAS 74/78 REFERENCE**	**Check Box √**	**Check Box √**	**Check Box √**	**Check Box √**	**Check Box √**
1. Valid Safety Management Certificate on board	Chapter IX, Annex I Regulation 6.2	☐	☐	☐	☐	☐
2. Evidence of a Safety Management System on board	Chapter IX, Annex I Regulation 5.0	☐	☐	☐	☐	☐
3. Evidence of internal audits being conducted	Chapter IX, Annex I Regulation 5.0	☐	☐	☐	☐	☐
4. Deficiencies and non-conformities reported to DPA, RO and Administration	Chapter IX, Annex I Regulation 5.0	☐	☐	☐	☐	☐
5. Evidence of Company assisting in correcting deficiencies	Chapter IX, Annex I Regulation 5.0	☐	☐	☐	☐	☐
6. Master aware of his responsibilities under the ISM Code	Chapter IX, Annex I Regulation 5.0	☐	☐	☐	☐	☐

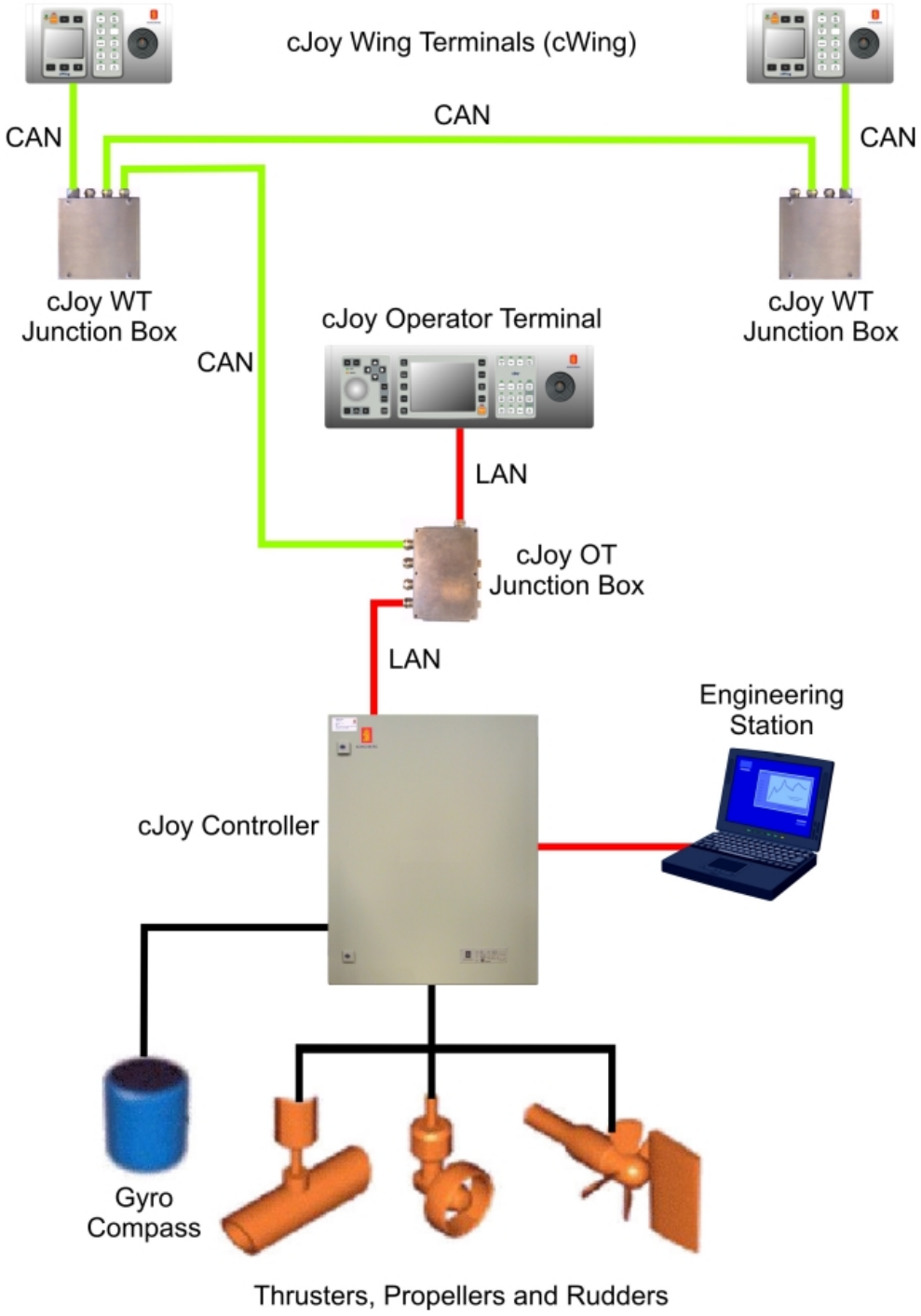
CHECK LIST 2 – PRIMARY LIFESAVING EQUIPMENT/SURVIVAL CRAFT

	WEEKLY DATE OF EXAMS:					
ITEM	**SOLAS/LSA CODE REFERENCES**	**Check Box √**	**Check Box √**	**Check Box √**	**Check Box √**	**Check Box √**
1. Operational Readiness	III / 20.6	☐	☐	☐	☐	☐
2. Survival Craft	III / 10-17 LSA Code Chapter IV	☐	☐	☐	☐	☐
– Required Type & Number Per Certificate	III / 20, 23-24 or III / 28, 31, LSA 4.1.6	☐	☐	☐	☐	☐
– Embarkation Area, Lighting, No Obstructions		☐	☐	☐	☐	☐
– Davits/Launching Gear		☐	☐	☐	☐	☐
– Instructions Posted		☐	☐	☐	☐	☐
3. Lifeboats	LSA 4.4 – 4.9	☐	☐	☐	☐	☐
– Condition	LSA 4.4.8	☐	☐	☐	☐	☐
– Required Equipment		☐	☐	☐	☐	☐
4. Liferafts	LSA 4.1 – 4.3	☐	☐	☐	☐	☐
– Condition	III / 24 LSA 4.1.5	☐	☐	☐	☐	☐
– Stowage/Launching Gear		☐	☐	☐	☐	☐
– Required Equipment		☐	☐	☐	☐	☐
5. Rescue boats	LSA 5.1	☐	☐	☐	☐	☐
– Condition	III / 14 & 17 LSA 5.1 – 6.1	☐	☐	☐	☐	☐
– Required Equipment		☐	☐	☐	☐	☐

Lampiran 3. Skema Prosedur Proses Mendapatkan Sertifikat DPO

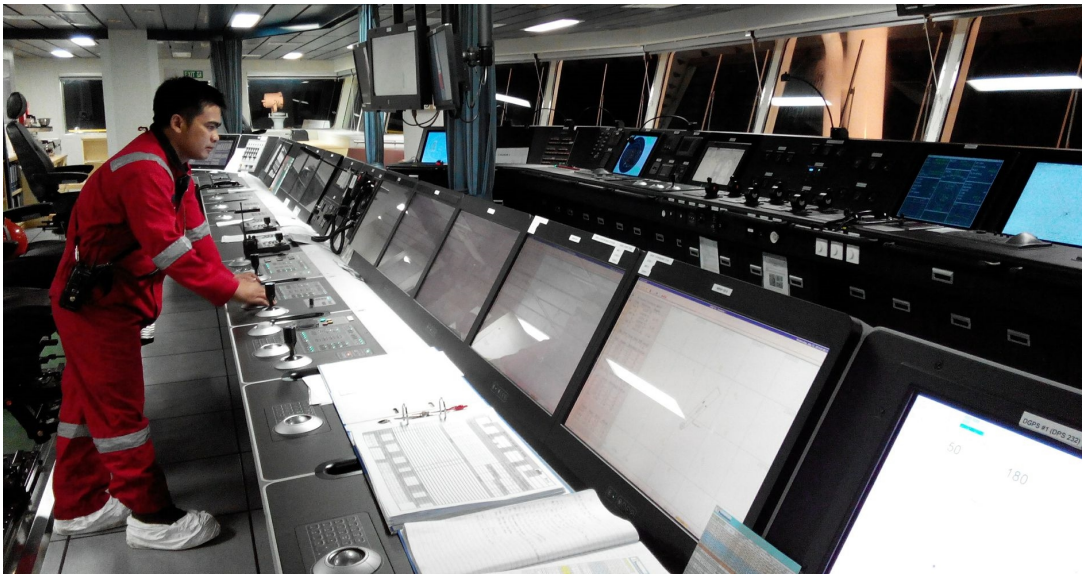


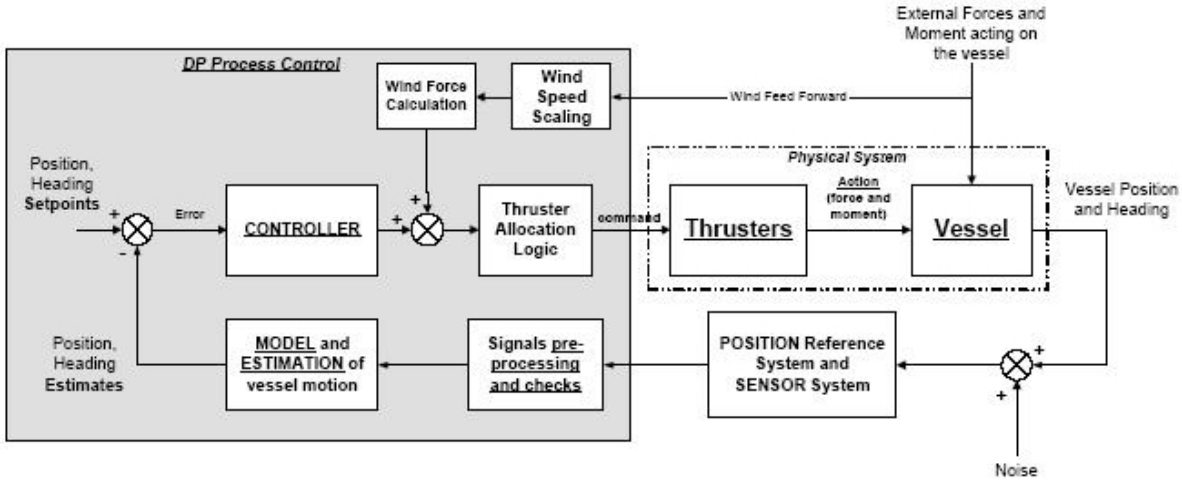
Lampiran 6. Skema Joystick operation



Lampiran 8. Gambar Kapal MV.Deepwater Asgard

Lampiran 5. Gambar DP Work Station dan Diagram Sistem DP





Gambar. DP Process control flow diagram

ISPS CODE
INTERNAL AUDIT – EAU
CHECKLIST / REPORT

Tracking No.

For Office Use Only

Type of Audit	*ISPS Code Internal Audit*	Source:	*ISPS Code*
Installation:		Audit Date:	
Auditor(s):	(Lead)	Audit Cycle:	Annually
		Report Date:	

NOTATION CODES

Compliance	**C**	Standards found to be ≥ specified requirements.
Observation	**O**	Comment on elements of the SSP that can be improved or made more effective.
Non-conformity	**NC**	Items that are not in accordance with the SSP and/or the ISPS Code
Not Applicable	**NA**	Either the line item does not apply to the area or the item is not being reviewed during this particular audit cycle.

	ISPS CODE - GENERAL	**Notation**
	INTRODUCTION	
1	**Is the ship management familiar with the Company objective and their policy on how to achieve these objectives?** *(As stated in the SSP)*	
	SHIP DATA	
2	**Are General ship data, as given in the SSP, including ship type, size parameters, restricted areas, shell doors etc. correct?** *(A check should be done that the plan is ship specific)*	
	SECURITY ASSESSMENT	
	The SSA has been reviewed in connection with the plan approval and shall not be verified during the shipboard verification.	
	SHIP SECURITY PLAN - DOCUMENTATION	
	GENERAL	Notation
1	**Is an approved Ship Security Plan available onboard?** *(This is necessary for the Shipboard verification to take place.* *The SSP should be approved by the Flag State Authority, by DNV or another RSO authorised by the Flag)*	ISPS A 9.1
	SHIP ORGANISATION AND COMMUNICATION	Notation

1	**Is the performance of all security duties ensured?** *(This item will be verified by confirming that the shipboard personnel know their duties and carry them out, that training, drill and exercises are performed and that records are kept)*	ISPS A 7.2.1
2	**Are The Communications systems according to the plan and are the communication procedures known to relevant personnel?** *(This should cover Communication:* *- within the ship;* *- with the Company;* *- with other ships;* *- with ports;* *- with relevant authorities.* *Check that the communications are maintained and safeguarded according to procedures)*	ISPS A 7.2.7 ISPS B 9.2.3 ISPS B 9.7.2
COMPANY SECURITY OFFICER (CSO)		Notation
1	**Can the Identified CSO be contacted on a 24 hour basis?** (*This item may be verified by contacting the CSO as described in the SSP)*	ISPS A 9.4.14
SHIP SECURITY OFFICER (SSO)		Notation
1	**Does the SSO know his duties as stated in the SSP?** *(These should include, but not be limited to:* *- undertaking regular security inspections of the ship to ensure that appropriate security measures are maintained;* *- maintaining and supervising the implementation of the ship security plan, including any amendments to the plan;* *- coordinating the security aspects of the handling of cargo and ship's stores with other shipboard personnel and with the relevant port facility security officers;* *- proposing modification to the ship security plan;* *- reporting to the CSO any deficiencies and non-conformities identified during internal audits, periodic reviews, security inspections and verifications of compliance and implementing any corrective actions;* *- enhancing security awareness and vigilance on board;* *- ensuring that adequate training has been provided to shipboard personnel;* *- reporting all security incidents;* *- coordinating implementation of the SSP with CSO and the relevant PFSO;* *- ensuring that security equipment is properly operated, tested, calibrated and maintained, if any)*	ISPS A 12.2
TRAINING OF THE SSO		**Notation**

1	**Can the SSO provide documented evidence that he fulfils the required qualifications as stated in the Code?** *(Documented evidence shall be a formal course diploma or a company statement by the CSO. Practical knowledge may be verified against the referenced parts of the Code.* *The SSO shall have practical knowledge of and received training, as appropriate, in some or all of the following:* *- security administration;* *- relevant international conventions, codes and recommendations;* *- relevant Government legislation and regulations;* *- responsibilities and functions of other security organizations;* *- methodology of ship security assessment;* *- methods of ship security surveys and inspections;* *- ship and port operations and conditions;* *- ship and port facility security measures;* *- emergency preparedness and response and contingency planning;* *- instruction techniques for security training and education, including security measures and procedures;* *- handling sensitive security related information and security related communications;* *- knowledge of current security threats and patterns;* *- recognition and detection of weapons, dangerous substances and devices;* *-recognition, on a non discriminatory basis, of characteristics and behavioural patterns of persons who are likely to threaten security;C20* *- techniques used to circumvent security measures;* *- security equipment and systems and their operational limitations;* *- methods of conducting audits, inspection, control and monitoring;* *- methods of physical searches and non-intrusive inspections;* *- security drills and exercises, including drills and exercises with port facilities;* *- assessment of security drills and exercises;* *- the layout of the ship;* *- the ship security plan and related procedures (including scenario-based training on how to respond);* *- crowd management and control techniques;* *- operations of security equipment and systems; and* *- testing, calibration and whilst at sea maintenance of security equipment and systems)*	ISPS A 13.2 ISPS B 13.1 ISPS B 13.2
	SECURITY SHIPBOARD PERSONNEL TRAINING	Notation

1	**Do Shipboard personnel having specific security duties and responsibilities understand their responsibilities for ship security as described in the ship security plan and do they have sufficient knowledge and ability to perform their assigned duties?** *(Such knowledge may include, as appropriate:* *- knowledge of current security threats and patterns;* *- recognition and detection of weapons, dangerous substances and devices;* *- recognition of characteristics and behavioral patterns of persons who are likely to threaten security;* *- techniques used to circumvent security measures;* *- crowd management and control techniques;* *- security related communications;* *- knowledge of the emergency procedures and contingency plans;* *- operations of security equipment and systems;* *- testing, calibration and whilst at sea maintenance of security equipment and systems;* *- inspection, control, and monitoring techniques;* *- methods of physical searches of persons, personal effects, baggage, cargo, and ship's stores)*	ISPS A 13.3 ISPS B 13.3
	OTHER SHIPBOARD PERSONNEL TRAINING	**Notation**
1	***Do All other shipboard personnel have sufficient knowledge of and are they familiar with relevant provisions of the SSP?*** *(Such provisions are including:* *- the meaning and the consequential requirements of the different security levels;* *- knowledge of the emergency procedures and contingency plans;* *- recognition and detection of weapons, dangerous substances and devices;* *- recognition, on a non discriminatory basis, of characteristics and behavioral patterns of persons who are likely to threaten security;* *- techniques used to circumvent security measures)*	ISPS B 13.4
	DRILL INTERVALS	**Notation**
1	**Are drills conducted at least once every three months in accordance with the drill plan of the SSP?** *(Check records. At least one drill should be performed prior to initial verification. The security surveyor may also require a drill as part of the verification)*	ISPS A 13.4 ISPS B 13.6
2	**Do records show that drills are performed when personnel have been changed, as described in the approved SSP and required by the Code?** *(Drills are performed within one week of more than 25% crew change)*	ISPS B 13.6
	EXERCISES	Notation

ISM INSTALLATION AUDIT CHECKLIST / REPORT

Tracking No.

For Office Use Only

Type of Audit _____ Source: *ISM Code*

Installation/Facility/Office: _____ Audit Date: _____

Auditor(s):) _____ Audit Cycle: Annual

_____ Report Date: _____

NOTATION CODES

Strengths	**+**	Standards found to be ≥ specified requirements.
Observation	**o**	Comment on elements of the management system that can be improved or made more effective.
Non-conformity		
• *Finding* (low)	**L**	Isolated finding against a company requirement.
• *Minor (medium)*	**M**	Non-compliance with a required regulatory, client or company system.
• *Major (high)*	**H**	Serious violation that immediately endangers personnel, property. A required regulatory, client or company system not addressed at all, not effectively implemented.
Not Applicable	**NA**	Either the line item does not apply to the area or the item is not being reviewed during this particular audit cycle.

ISM Code - General		**Ref: *SECTION 1***	**Notation**	
			Self	**IA**
1	**Does the installation have a SOPEP or spill response plan? Is it current?(Ref: HQS-HSE-PP-01 Section 4 Subsection 3.2)**			
A				**X**
	Captain			
2	**Does the installation have a SOLAS training manual in accordance with the 1989 MODU Code section 14.10?**			
A				
	Captain			**X**
a)	**Is it available to all persons onboard?**			
A				
	Captain			**X**
3	**Have all Class surveys and inspections occurred in a timely manner and within the allowed window? Ref: (HQS-OPS-HB-05 Section 2 Subsection 1, HQS-OPS-HB-03 section 1.8)**			
A				**X**
	Captain			
4	**Latest weekly Notices to Mariners received on board, charts updated?**			
A				**X**
	Captain			
5	**Has the Master spot-checked the following documentation for legibility and accuracy?(Ref:HQS-OPS-004 Section 3 Subsection 1)**			
a)	**Charts in use:**			
A				
	Captain			**X**

b)	**Light list in use:**		
A			
	Captain		**X**
c)	**Bridge log & bell book:**		
A			
	Captain		**X**
d)	**Official log:**		
A			
	Captain		**X**
e)	**DP log:**		
A			
	Captain		**X**
f)	**Medical treatment log:**		
A			
	RSTC		**X**
g)	**GMDSS Log:**		
A			
	Captain		**X**
h)	**Oil record book:**		
A			
	Captain/Maintenance Supervisor		**X**
i)	**Record of Garbage Discharge:**		
A			
	Captain		**X**
J)	**Is a MARPOL compliant waste management plan available and implemented? (Ref: HQS-HSE-PP-01 Section 5 Subsection 5)**		
A			
	Captain		**X**
k)	**Does it contain the disposal requirements of regulations 3 and 5 of MARPOL Annex V?**		
A			
	Captain		**X**
L)	**Are personnel informed of the plan during orientation?**		
A			
	Orientation		**X**

ISM Code - Safety and Environmental Protection Policy	**Ref: *SECTION 2***	**Notation**	
		Self	**IA**
1	***Have the FIRST Core Values, Mission Statement, and HSE policy statements been communicated to the workforce?(Ref:HQS-HSE-PP-01)***		
A			**X**
	Interviews with personnel		
2	***Are the latest revisions of the FIRST Core Values, Mission Statement, and HSE Policy posted conspicuously around the installation (same as current version on the Intranet)?***		
A			**X**
	Check the bulletin boards		

4	***Is the vessel /facility in compliance with the following Risk Management policies and procedures per the HQS-HSE-PP-01 manual? (section 4 subsection 2) & (section 3 subsection 1)***		
	Pathogens -		
A			
	THINK Planning Process -		X
A			
	Permit to Work -		X
A			
	Client, Subcontractor Personnel & Equipment -		X
A			
	Dress Requirements & Personal Protection Equipment -		X
A			
	Observations, interviews and records		
5	***Is the vessel in compliance with the following Implementing and Monitoring policies and procedures as of the HQS-HSE-PP-01 manual? (section 3 subsection2) & (section 4 subsection 5)***		
	Installation Clinics & Medical Documentation -		X
A			
	Potable Water -		X
A			
	Sanitation, Hygiene & Smoking Limitations -		X
A			
	Start Process -		X
A			
	Travel -		X
A			
	General Safe Work Practices		X
A			
	Energy Sources & Isolation		X
A			
	Fall Protection -		X
A			
	Mechanical Lifting -		X
A			
	Hazardous Material -		X
A			
	Personal Impairment -		X
A			
	Electrical Safety -		X
A			
	Observations, interviews and records		
6	***Is the vessel in compliance with the following Planning policies and procedures as per the HQS-HSE-PP-01 manual? (section 4 subsection 3)***		
	Hydrogen Sulfide -		X
A			

	Emergency Response -		X
A			
7	***Is the vessel in compliance with the Communication policy and procedures as per the HQS-HSE-PP-01 manual? (section 4 subsection 4)***		
	HSE Information - (HSE alerts, HSE signs, Hazard Mapping, HSE advisories, QHSE bulletin board, Dailey Communications and Monthly Incident Rate Chart)		X
A			
	Observations, interviews and records		
7	***Is the vessel in compliance with the Evaluating and Improving policies and procedures as per the HQS-HSE-PP-01 manual? (section 4 subsection 6)***		
	HSE Recognition -		X
A			
	FOCUS Improvement Process		X
A			
	Incident Reporting -		X
A			
	Observations, interviews and records		
8	***Is the vessel in compliance with the Orientation and Training policies and procedures as per the HQS-HSE-PP-01 manual? (section 4 subsection 1)***		
	HSE Orientation -		X
A			
	Drugs, Alcohol & Weapons in the Workplace -		X
A			
	Training -		X
A			
	Observations, interviews and records		
9	***Is the vessel in compliance with the Environment policies and procedures as per the HQS-HSE-PP-01 manual? (section 5 subsection 1)***		
	Drainage & Discharge -		X
A			
	Reporting -		X
A			
	Emissions -		X
A			
	Product Selection & Waste Minimized Management -		X
A			
	Observations, interviews and records		
10	***Is the vessel in compliance with the Equipment and Operation policies and procedures as per the HQS-OPS-001 manual? (section 4 subsection 1)***		
A			X
	Observations, interviews and records		

11	***Is the vessel in compliance with the Management of Change policies and procedures as per the HQS-HSE-PP-001 manual? (section 1 subsection 5)***		
A			
	interviews and records		
12	Is the vessel in compliance with the following requirements of the ISPS code? (Ref: IMO ISPS code)		
	Periodic review and Annual Internal audit of the ship security assessment & ship security plan by the CSO, Capt. and SSO -		
A			
	Records of the following activities: training, drills, exercises, security threats, security incidents, breaches of security, and changes in security levels -		
A			
	Has the ship security officers received approved security training course?		
A			

ISM Code - Company Responsibilities and Authority	**Ref:** ***SECTION 3***	**Notation**	
		Self	**IA**
1	***Is there an organization chart depicting the interrelationship of both shore-based and onboard personnel? Is it current?(Ref: ISM code 3.2)***		
A			**X**
	Check bulletin boards		
2	***Are job descriptions (requirements/qualifications/HSE responsibilities/limits of authority) established for all positions?(Ref: HQS-HRM-PP-01 Section 2 Subsection 1.3)***		
A			**X**
	Check job descriptions		
3	***Do all company personnel onboard have a job description available to him / her in a language understood by them, and are they familiar with them? (Ref: HQS-HRM-PP-01)***		
A			**X**
	Interviews		
4	***Does the Station Bill agree with Emergency Response Plan, Job Descriptions, Organizational Chart, and the installation Marine Operations Manual related to responsibilities and duties.***		
A			**X**
	Examine station bill, ERP, job descriptions and Organizational charts for correlation		

ISM Code - Designated Person(s)	**Ref:** ***SECTION 4***	**Notation**	
		Self	**IA**
1	***Have the Designated Person(s) been identified and communicated to the installation? (Ref: HQS-HSE-001 Section 2 Subsection 2)***		
A			**X**
	interviews		
2	***Are personnel familiar with the duties and responsibilities of the Designated Person?***		
A			**X**
	interviews		
3	***Has the Designated Person been recognized in Emergency Contact Lists?***		
A			**X**
	Examine contact list in the Emergency Response Manual & Medical Emergency Response manual		

ISM Code - Master's Responsibility and Authority	**Ref:** ***SECTION 5***	**Notation**	
		Self	**IA**
1	***Can installation personnel identify the PIC during an emergency (defined in the Floating Operations manual)***		

A			X
	interviews		
2	*Is the Master shown as the PIC on the Station Bill? (Ref: GCD-HSE-001 Section 4 Subsection 3.5)*		
A			X
	Examine station bill		
3	*Have the Master, OIM, and other vessel supervisors participated in an onboard QHSE Steering Committee review of the management system? Are the results documented and retained onboard the vessel?*		
A			X
	Check steering committee records		
4	*Have corrective actions from the QHSE Steering Committee been immediately actioned or entered into FOCUS (GRS)?*		
A			X
	Check FOCUS report		
5	*Is the PIC aware of their duties and responsibilities as defined in section Five of the ISM Code and the Floating Operations manual, Section 3.1?*		
A			X
	Interview with Captain		
ISM Code - Resources and Personnel		**Ref:** *SECTION 6*	**Notation** Self / IA
1	*Does the installation have the appropriate number of licensed personnel, in line with the Minimum Safe Manning Certificate (MSMC), aboard the installation? (Ref: HQS-OPS-004 Section 3 Subsection 1*		
A			X
	Interview with Captain		
2	*Do all licensed personnel have licenses issued by the appropriate Flag state?*		
A			X
	Interview with Captain		
3	*Are the MSMC licenses filed or posted under glass as required?*		
A			X
	Interview with Captain		
4	*Do all seamen aboard, per the Minimum Safe Manning Certificate, have the proper seafarer's certification, including licenses, special qualification certificates, seafarers ID and record books and required training (i.e. STCW 95)?*		
A			X
	Interview with Captain		
5	*Do licensed and certified personnel have the original copies of their licenses on board the installation?*		
A			X
	Interview with Captain		
8	*Does the installation maintain a library of current regulations, codes and guidelines as specified in the Field Operations Manual?*		
	Reference; HQS-OPS-HB-05 (section 3 subsection 2.1 appendix 1)		
	Interview with Captain		
d)	*ISM Code STCW Code (Seafarer's Training, Certification and Watchkeeping Code)*		
A			
	Interview with Captain		X
e)	*Class Does the installation have access to Classification Society Rules?*		

A			
	Interview with Captain		**X**
f)	***Does the installation have the appropriate Flag and Coastal State rules aboard the installation?***		
A			
	Interview with Captain		**X**
a)	***Core Values***		
A			
	Posted		**X**
b)	***Colors program***		
A			
	Interview with RSTT/RSTC		**X**
c)	***HSE Policy***		
A			
	Posted		**X**
d)	***Station Bill***		
A			
	Posted		**X**
e)	***Fire and Safety Plan***		
A			
	Posted		**X**
f)	***Well Control duties and responsibilities for drill floor crews?***		
A			
	Posted		
	Toolpusher		**X**
11	***Are personnel receiving training as specified by the Company Training Matrix? (GCD- HSE- 001 Section 4-1.3)***		
A			
	Examine training records with RSTC		
12	***Is Captain receiving Updates from DP Bulletin Board (NAR DP Policy Document March 19,2004)***		**X**
A			
	Interview with Captain		
13	***Has Captain recently visited the Company DP Intranet page (NAR DP Policy Document March 19,2004)***		
A			**X**
	Interview with Captain		
14	***Is DP data being logged (NAR DP Policy Document March 19,2004)***		**X**
A			
	Interview with Captain		
15	***Is Vessel Management System data being logged (NAR DP Policy Document March 19,2004)***		**X**
A			
	Interview with Captain		
16	***Is DP vendor software version tracked (NAR DP Policy Document March 19,2004)***		**X**
A			

Attachment No.1 - Hurricane Check-Off Sheet

Items to Check	Status	Initial
OIM		
Monitor fuel, lubes, potable water, drilling fluids, and provisions.		
Monitor derrick setback (Max survival condition 1,800Kips.)		
Prepare non-essential personnel list for down-manning.		
Verify status of arrangements for hotels and ground transportation.		
Monitor weather		
Plan escape routes.		
Update vessel's crew of hurricane plans		
Keep Rig Manager informed of progress.		
Maintain list cars which need to be moved.		
Have personnel sign letters authorizing cars to be moved and accepting responsibility for the move-ment.		
Move cars to higher ground and make arrangements for car keys to be returned or left with the Client dis-patcher.		
Obtain Bathometric charts of area		
Marine Department		
Verify adequate quantities of lashing equipment are onboard and in good workin condition (turnbuckles, wires, shackles, chain, ratchet straps, etc.)		
Verify adequate quantities of visqueen, dunnagee and plywood is onboard.		
Verify at least one 600ft coil of manilla lashing rope in each sizes - 1/4", 1/2", 3/4" and 1" is kept onboard.		
Verify adequate quantity of chicken wire are kept onboard.		
Verify adequate quantities of wood plugs are kept onboard.		
Verify operation of two portable Wilden pumps com-plete with hoses for dewatering are kept onboard.		
Ensure sufficient quantities of helifuel are kept onboard.		
Press up any slack tanks as appropriate.		
DPO's update hurricane tracking information as re-quired.		

Keep an updated stability profile for worst case scenario with all mud on board, set back, deck loads and review with OIM		
Secure all loose equipment on main deck and vent houses.		
Secure all watertight and weather tight doors and hatches as appropriate.		
Check all sounding tube caps are securely in place.		
Secure ventilation hatches in coordination with the Chief Engineer.		
Secure all thruster spaces in coordination with the Chief Engineer.		
Recover bulk hoses to main deck and secure as appropriate.		
Clear all scuppers, drains.		
Consult with Client Representative and secure accoustic current meter as appropriate.		
Shut all dead lights on accommodation windows.		
Close main deck deadlights first and other decks as necessary.		
Check Anchors 2 and 6 are secure.		
Close all red valves for mooring wires and chains.		
Sound all tanks, voids, cofferdams, etc -		
Monitor and record tank levels throughout heavy weather.		
Bleed off all pressure from bulk tanks and close all valves. Secure bulk tanks with storm bolts.		
Slack off fall wire on rescue boat and install gripes..		
Secure the flare booms.		
Line up skimmer tank and riser bays in bypass mode.		
Secure lifeboat retrieval bridge cranes.		
Make periodic rounds of the ship using buddy system. Check lashings are tight and watertight integrity.		
Pull up Hydrophones to transit position		
Secure Helideck equipment, locker doors, etc		
Check and tighten Liferaft lashings		
Attach maintenance turnbuckles to lifeboat		
Make all crane lifts to stow/secure equipment.		
Secure all riser pup joints.		
Secure all equipment in pipebays and main deck.		
Secure heavy tool room.		
Secure Sack Room.		
Assist Marine Department secure all decks.		
Assist Subsea Engineers secure their equipment.		

Assist LARS personnel secure equipment.		
Secure all crane booms in cradles - secure cabs and engine compartments.		
Barograph fitted with paper and ink		
After ballasting to Survival hard copies of VMS data recorded.		
Open Riser Drain and bypass helideck drains to sea		
Try to have weather peak on side of rig without radar.		
Drilling Department:		
Set storm packer, secure well and POOH.		
Displace and Pull Riser.		
Secure LMRP and drill floor.		
Lay down excess tubulars from hole and derrick. **If pipe remains in derrick it must be secured tight against racker by other means.**		
Secure derrick and rig floor.		
Minimize free surface and monitor pit levels.		
Secure doors and equipment in drilling areas.		
Shutdown Hydrocarbon vacuum unit when apppropriate.		
Assist Crane Crews in securing all drilling related equipment on all decks - in all spaces assigned to Drilling Dept.		
Engineering Department:		
Secure all engine room and machinery spaces.		
Secure all thruster compartments in coordination with the marine department.		
Test run the emergency generator.		
Strip all bilge spaces around vessel as dry as possi-ble.		
Fuel Filters Changed/Clean		
All settling tanks and day tanks filled before weather arrives		
Strainers Cleaned		
Bypass drain tanks to go directly to sea.		
Electrical Department		
Secure spaces and monitor ventilation requirements.		
Chief Steward, Storekeeper, Sub Sea Engineers, All Third Party Supervisors - are responsible for securing their areas well in advance of the weather's approach.		
Subsea Department		
Secure BOP and Riser Cranes.		
Catering Department		

Chief Steward & Storekeeper secure their areas well in advance of heavy weather.		
Make Food Order Early		
Client Representative		
Assist with daily preparation of Hurricane Calculator timings.		
Provide daily weather reports and coordinate decisions with Rig Superintendent and OIM.		
Arrange helicopter flights for down-manning non-essential personnel.		
Ensure all third party supervisors secure their areas well in advance of the weather's approach.		

Attachment No.2 - Vessel Inspection Record

Area of Inspection	Status	Initial
OIM		
Marine Department		
Riser Bay		
Port Crane		
Stbd. Crane		
Knuckle Boom Crane		
Starboard Side		
Thrusters 1 & 2		
Ballast Pump Room S1		
Ballast Pump Room S2		
Starboard Pontoon Tunnel		
Ballast Pump Room S3		
Ballast pump Room S4		
Thrusters 3 & 4		
Starboard Stairwell 8.5/14 Mtr Level		
Starboard Forward 14 Mtr Level		
Starboard Forward Vent Termination Room		
Starboard Forward Switch Board Room		
Starboard Aft Escape P4 Ballast Pump Room/14 Mtr Level		
Starboard Aft 14 Mtr Level		
Starboard Aft Vent Termination Room		
Port Side		

Thrusters 7 & 8		
Ballast Pump Room P1		
Ballast Pump Room P2		
Port Pontoon Tunnel		
Ballast Pump Room P3		
Ballast Pump Room P4		
Thrusters 5 & 6		
Port Forward Stairwell 8.5/14 Mtr Level		
Port Forward 14 Mtr Level		
Port Forward Vent Termination Room		
Port Forward Switch Board Room		
Port Aft Escape S4 Ballast Pump Room/14 Mtr Level		
Port Aft 14 Mtr Level		
Port Aft Vent Termination Room		
Watermist Room		
Drilling Department:		
Heavy Tool Room		
Derrick		
Drill Floor		
Drawworks Area and Roof		
Drillers Shack		
Cement Room		
Cement House Roof		
Mud Lab		
Mud Cond.Room/Solids Control		
Mud Treatment House		
Mud Pit Room		
Sack Room		
Mud Pump Room		
Walkway Between Pump Room & S2		
Shaker House		
Shaker House Roof		
Riser Extension Deck		
Aft Wire Line Deck		
Riser Bay		
Moonpool Area - All Areas all levels		
Pipedecks		
Engineering Department:		
Starboard Side		
Thrusters 1 & 2		
Ballast Pump Room S1		
Ballast Pump Room S2		
Starboard Pontoon Tunnel		

Ballast Pump Room S3		
Ballast pump Room S4		
Thrusters 3 & 4		
Starboard Stairwell 8.5/14 Mtr Level		
Starboard Forward 14 Mtr Level		
Starboard Forward 22 Mtr Level		
Quarters Air Conditioning Machinery Room		
Starboard Forward Vent Termination Room		
Starboard Forward Switch Board Room		
Starboard Forward HPU Room		
Starboard Aft Escape P4 Ballast Pump Room/14 Mtr Level		
Starboard Aft 14 Mtr Level		
Starboard Aft 22 Mtr Level		
Starboard Aft Purifier/Watermaker Room		
Starboard Aft Vent Termination Room		
Incinerator Room		
Starboard Aft Ship Service Switch Board Room		
Starboard Aft Switch Board Room		
Starboard Engine Room		
Starboard High Voltage Room		
Port Side		
Thrusters 7 & 8		
Ballast Pump Room P1		
Ballast Pump Room P2		
Port Pontoon Tunnel		
Ballast Pump Room P3		
Ballast Pump Room P4		
Thrusters 5 & 6		
Port Forward Stairwell 8.5/14 Mtr Level		
Port Forward 14 Mtr Level		
Port Forward 22 Mtr Level		
Port Forward Vent Termination Room		
Port Forward Switch Board Room		
Port Forward HPU Room		
Port Aft Escape S4 Ballast Pump Room/14 Mtr Level		
Port Aft 14 Mtr Level		
Port Aft 22 Mtr Level		
Port Aft Purifier/Watermaker Room		
Port Aft Vent Termination Room		
Watermist Room		
Rig Service Air Compressor Room		
Port Aft Switchboard Room		
D.P. Chiller Room		

Port Engine Room		
Port High Voltage Room		
Machine Shop		
Rig Mechanic/Hydraulic Tech Workshop		
Electrical Workshop/Office		
Rig Air Receiver Room		
HP Air Compressor Room		
Sub Sea/Electrical Supervisor Office		
Technical Library		
Chief Eng Office		
Engine Control Room		
Emergency Generator Room		
Welders Shop		
Safe Welding Area		
Brake Resistor Room		
Fan Houses		
Electrical Department		
Living Quarters Equipment Room		
Living Quarters Network Room		
Drill Floor Local Equipment Room		
Emergency Generator Room		
High Voltage Switch Gear Room #1		
High Voltage Switch Gear Room #2		
Port Forward Machinery Space (Electrical Cage)		
Electic Work Shop		
ET Workshop		
Subsea Department		
SSE Area - Port Side		
SSE Area - Stbd Side.		
Subsea Shop		
Accumulator Room		
APV Room		
Pod House		
Catering Department		
Quarters		
Messhall		
Galley		
Quarters equipment storage rooms		
Change room locker		
Storekeeper		
StoreRoom		
P1 -storeroom		

Client Representative		

REPORTING:

Reports to the Senior Dynamic Positioning Operator (DPO) and functionally to the Chief Mate

SUPERVISION:

None

LOCATION:

Dynamically positioned vessels

PREREQUISITES / QUALIFICATIONS:

- Valid Unlimited Mate License with 1 year DPO experience (or 1 year unlicensed***** DPO Experience) from the issue date of the DP log book
- Recommendation by Master/OIM or Rig Manager and supported by recent performance appraisal
- Valid medical examination and vaccination certificates
- Knowledge of basic technical calculations required for the safe operation of the marine aspect of the rig
- Basic computer skills
- Meet all requirements as listed on the WWTM and the WW Licensing Matrix including but not limited to the following:
  - Unlimited Nautical Institute DP Certificate
  - GMDSS license
  - Lifeboatman certificate
  - Radar observers certification with ARPA endorsement
  - ECDIS training required on vessels with ECDIS equipment installed
  - Comprehensive Stability

***** DP Operators with a Nautical Institute Certificate prior to 1 January 2012 who do not hold an Unlimited Mate's License will be grandfathered from the Unlimited Mate License requirement.

BASIC FUNCTION:

Operate the DP system and the VMS (where applicable)

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	DYNAMIC POSITIONING OPERATOR 2	Revision Date: 26 October 2012
		Revision: 3

DUTIES AND RESPONSIBILITIES:

Operations/Maintenance:

- Operate dynamic positioning equipment. **Authority II**
- Operate and understand the ballast control system, Power Management System and fire and gas systems **Authority II**
- Maintain the rig in a stable condition and at the correct draft and trim **Authority II**
- Assist in the setup of the DP system operational parameters **Authority II**
- Ensure that all DP system data are recorded **Authority I**
- Advise the Driller and Chief Mate of potential position loss **Authority I**
- Assist in performing Preventive Maintenance on DP equipment **Authority II**
- Assist with running and maintaining records for hydrophones and subsea beacons **Authority II**
- Make regular use of the onboard simulator, where available **Authority II**
- Ensure that there is adequate power and reserves of power for the maintenance of position and operations; give immediate attention to any problems **Authority II**
- Ensure that all defects and anomalies are reported to the Chief Mate or Senior DPO and relevant department heads. Maintain records of these and ensure that they are corrected adequately **Authority I**
- Understudy the Senior DPO **Authority I**
- Stand navigation watch as authorized by the individual's license **Authority II**
- Manage the deck crews, working outside with them as required **Authority II**
- Sound ballast and bulk tanks. Assist with loading and sampling of bulk products as required **Authority II**
- Assist Chief Mate and Master with deck operations as required. **Authority II**
- Operate vessel's radios as required **Authority II**
- Operate vessel's radars as required **Authority II**
- Perform emergency duties and responsibilities as stated on the Station Bill, DP Emergency Response Plan and vessel specific Emergency Response Manual **Authority II**
- Complete ISM familiarization material **Authority II**
- Monitor all DP room alarms including DP system, VMS, Fire & Gas; Prioritize alarm response as necessary to maintain DP system operability by calling for technical assistance or additional DP room help **Authority II**
- Assist as directed by Chief Mate with rig projects **Authority II**
- Control the vessel using manual and joystick controls **Authority II**
- Use the Data Logger to optimize DP and Power Plant Operations **Authority II**

- Use the Data Logger to detect and mitigate DP and Power Plant problems **Authority II**
- Use the Data Logger to backup data **Authority I**
- Export Data Logger data to Excel Format **Authority I**
- Use radar displays for detection and interpretation of local severe weather patterns **Authority III**
- Know principles and planning of Power Plant operations **Authority II**
- Possess a basic understanding of diesel generator controls, operations, and failure modes **Authority II**
- Be familiar with principles of basic closed-loop control system theory **Authority II**
- Be familiar with Emergency Response Manual **Authority II**
- Be familiar with operation of all software required for the DPO position **Authority II**
- Know principles of thrusters performance, failure modes, and operation **Authority II**
- Know principles of DP operations **Authority I**
- Possess basic knowledge of the practical operation of the DP control system, including changing between systems and the various modes of operation **Authority I**
- Know principles of DP processing of reference systems, wind sensors, VRS, and other peripheral equipment **Authority I**
- Know basic operational theory, calibration methods, and failure modes of electronic riser and stack angle sensors **Authority I**
- Possess a basic understanding of WSOC, drift-off calculations, and riser analysis **Authority I**
- Possess a basic understanding of rig offset test to verify stack heading **Authority I**
- Possess a basic understanding of ROV operations **Authority I**
- Possess a basic understanding of EDS sequences and BOP operations **Authority I**
- Possess a basic understanding of drilling operations and well control **Authority I**
- Possess a basic understanding of boat handling **Authority I**
- Possess a basic understanding of helicopter operations **Authority I**
- Be familiar with basic operational theory and failure modes of pitch/roll/heave sensors **Authority I**
- Be familiar with basic operational theory and failure modes of satellite and acoustic position reference systems **Authority I**

- Possess knowledge of general math, trigonometry, and geometry **Authority I**
- Possess a basic knowledge of architecture of distributed automation systems **Authority I**
- Possess system-specific knowledge of DP Control System redundancy, alarms and warnings **Authority I**
- Possess system-specific knowledge of Vessel Management System redundancy, alarms and warnings **Authority I**
- Know operational response to all DP alarms (who to call, what to do) **Authority I**
- Know operational response to all Vessel Management System alarms (who to call, what to do) **Authority I**
- Know vessel's operations manuals and communications system **Authority I**
- Know vessel's FMEA and its implications **Authority I**
- Complete training on any other systems relevant to the DP **Authority I**

QHSE:

- Incorporate the THINK planning process into all tasks, whether working alone or as part of a team **Authority I**
- Participate in START Process **Authority I**
- Call a Time Out for Safety (TOFS) whenever an unplanned hazard or a change in the expected results is observed **Authority I**
- Carry out assigned duties in a safe manner according to Company policies and procedures **Authority I**
- Assist the Senior DPO, Chief Mate and/or Master during emergency situations and emergency protection responses as designated on the Station Bill **Authority II**
- Perform emergency duties and responsibilities as stated on the Station Bill, DP Emergency Response Plan, and the vessel specific Emergency Response Manual **Authority II**
- Assist in communicating all Company QHSE policies and other information to all rig personnel **Authority II**
- Play an active part in the weekly meetings and all other Company safety management systems **Authority I**
- Ensure that a high standard of hygiene and housekeeping is maintained onboard the rig **Authority I**
- Perform planned maintenance of life saving, firefighting and other marine equipment **Authority II**

Personnel:

- Meet the training requirements according to the applicable training matrix	**Authority I**
- Participate fully in the annual performance appraisal process	**Authority I**
- Assist in training of crewmembers in firefighting, safety and deck operations	**Authority II**

DEFINITION OF DECISION MAKING AUTHORITY:

Authority I: To act
Authority II: To act but inform supervisor and/or other interested parties
Authority III: To obtain supervisor's approval before acting

***Note**: The above is not a complete list of duties but a guide, as tasks and objectives can change depending on needs.*

DP ALERT CONDITIONS (STANDBY CONDITIONS)

Purpose/Scope

All standby conditions are executed and adhered to by all personnel in accordance with Transocean policies and procedures (see the Deepwater Field Operations Procedures (HQS-OPS-PR-05), section 1.3.1).

Checklist/Procedure

DP ALERT CONDITION Checklist

CONDITION:

- ☐ WELL TESTING
- ☐ ADVERSE WEATHER
- ☐ DP DEGRADED
- ☐ CEMENTING
- ☐ NON-SHERABLE Date:_____. Start time_____. End time_____.
- ☐ WELL CONTROL OPERATIONS

PA made by the Bridge at discretion of Captain: Attention on the Vessel, We are under a DP ALERT CONDITION for _____ until further notice. All assigned personnel proceed to your Alert Station and inform the Bridge @ phone 2001

ALERT STATIONS: Captain _____ OIM_____

- ☐ DP/BRIDGE – Sr DPO _____ DPO`s _____ Elect Supv_____ Maint. Supv._____
- ☐ ECR - Chief Mechanic _____ Chief Electrician _____ Chief ET_____
- ☐ BOP PANEL – Subsea _____.
- ☐ RIG FLOOR AND MOONPOOL - Driller _____ Tool Pusher_____
- ☐ CEMENT UNIT - Cementer _____.
- ☐ OTHERS (SPECIFY): _____. Mud Eng. _____ ROV Super_____ Mud log._____

ACTIONS TAKEN:

- ☐ PRE JOB MEETING
- ☐ VERIFY/PERFORM MAINTENANCE OF ASSOCIATED CRITICAL EQUIPMENT TO THE OPERATION
- ☐ PTW (related/impacted) SUSPENDED
- ☐ DP CAPABILITY ANALYSIS PLOT (done & printed)
- ☐ NO S/V INSIDE 500m ZONE
- ☐ ROV Status in/out water
- ☐ SUSPEND ANY HAZARDOUS OR FLAMMABLE BULK, FLUID TRANSFER FROM S/V A/S
- ☐ SUSPEND CRANE OPERATIONS
- ☐ POTENTIAL DROPPED OBJECTS

Deepwater Asgard

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Ultra-Deepwater Dual-Activity Drillship

General Description

Design / Generation ..... DSME 12000 Ultra Deepwater Drillship
Constructing Shipyard ..... DSME (South Korea)
Year Entered Service / Significant Upgrades ..... 2014 / N/A.
Classification ..... DNV X1A1
Flag ..... Marshal Islands
Dimensions ..... 781 ft long x 138 ft wide x 62 ft deep
Drafts ..... 39.4 ft operating / 29.5 ft transit
Accommodation ..... 200 persons
Displacement ..... 114,640 st operating
Variable Deck ..... 22,636 st operating / 22,636 st transit
Transit Speed ..... up to 12.5 knots
Maximum Water Depth ..... 12,000 ft designed / 10,000 ft outfitted
Maximum Drilling Depth ..... 40,000 ft

Drilling Equipment

Derrick	Dual Aker MH Pyramid Dynamic Derrick 213 ft x 69 ft. x 52 ft
Hookload Capacity	(Main) 2,800,000 lbs. gross nominal capacity
	(Aux) 2,200,000 lbs. gross nominal capacity
Drawworks	(Main) AKMH Wirth GH 9000 EG-AC-1G, 4 x AC motors; 9,000 hp, 1,553 mt with 16 x 2-1/4 inch lines strung lines
	(Aux) AKMH Wirth GH 6000 EG-AC-1G, three AC motors; 6,000 hp, 1,140 mt with 14 x 2 inch lines strung
Compensator	(Main) Aker MH Crown Mounted Compensator with Active heave compensation, 750 st (680 mt) with 25 ft max stroke.
	(Aux) Aker MH Crown Mounted Compensator with Active Heave, 500 st (454 mt) with 25 ft max stroke.
Rotary Table	(Main) AKMH Wirth RTSS 75-1/2 inch hyd. 1250 st (1,134 mt)
	(Aux) AKMH Wirth RTSS 60-1/2 inch hyd. 1,000 st (908 mt).
Top Drive	(Main) 2 x Aker MH MDDM-1250-AC-2M 1,250 st (1,134 mt) tripping load, 945 st (857 mt) drilling load, 101,000 ft./lbs. max continuous torque at 113 RPM, 0 - 280 max RPM, 2 x 1,050 hp ABB AC motors.
	(Aux) N/A.
Tubular Handling	2 x Aker MH Hydraulic Roughneck BC 561, multi frame, tubular range 3-1/2 inch to 9-3/4 inch. Aker MH racking systems tubular range 3-1/2 inch to 14 inch. 2 x Vertical Pipe Racking Systems including 15 st bridge cranes with lower guiding arms. 1 x Horizontal Tubular Feeding Machine to handle single joints drill pipe and casing or casing stands up to 90 ft.
Riser Feed	1 x Horizontal Riser Feeding Machine for 21 inch x 75 ft Riser Joints.
Mud Pumps	4 x AMH/Wirth TPK-7-1/2 x 14, 2,200 hp 7,500 psi
HP Mud System	Rated for 7,500 psi.
Solids Control	8-x Derrick, Dual Pool (DP626); DP600 shale shakers

Power & Machinery

Main Power	6 x HHI HiMSEN H32/40V V-type diesel engines rated 7,000 kW, 720 rpm, each driving 1 x 8,125 kVA AC generator
Emergency Power	1 x Caterpillar 3516B V-type diesel engine rated 1,780 kW, 1,800 rpm driving 1 x AC generator
Power Distribution	3 x Siemens NXPlus C Plus, 11 kV Switchboards with AKA Advanced Generator Protection.

Storage Capacities

Fuel Oil ..... 51,280 bbl
Liquid Mud ..... 9,745 bbl active / 10,562 bbl reserve (20,077 bbl total)
Base Oil ..... 5,031 bbl
Brine 5,031bbl
Drill Water ..... 18,869 bbl
Potable Water ..... 9,359 bbl
Bulk Material ..... (mud + cement) 28,251 cu.ft
Sack Storage ..... 10,000 sacks

BOP & Subsea Equipment

BOP Rams	1 x Cameron 18-3/4 inch, 15,000 psi 7-ram preventer; (2 x TL Doubles + 1 x TL Triple).
BOP Annulars	1 x Cameron Dual DL 18-3/4 inch (2 x elements), 10,000 psi annular preventer.
BOP Handling	BOP crane 2 x 275 st main hoists and 2 x 16.5 st service hoists; with BOP Trolley rated 595 st. 2 x 551 st BOP storage stands with sea-fastening.
Marine Riser	Cameron Load King 21 inch, 3,500 kips (H Class), 75 ft long per joint
Tensioners	8 x Aker MH Dual wireline riser tensioners, 250 kips each. Total capacity 4,000 kips with 12.5 ft stroke 50 ft max stroke.
Diverter	21-1/4 inch 500 PSI Type CSO diverter with 16 inch flow line
Tree Handling	1 x 165 st Xmas tree trolley with 2 x 165 st Xmas tree skid carts supplied with room to store up to 4 x carts. Xmas trees can also be lifted or handled with the 181 st. Active Heave Compensating Subsea Crane.
Moonpool	82 ft. x 33.5 ft. Outfitted with a two piece Moonpool Guide Array for improved transit characteristics.

Station Keeping / Propulsion System

Thrusters	6 x (three at forward, three aft) Rolls Royce 5,500 kW variable speed, fixed pitch, fully azimuthing, underwater demountable thrusters.
DP System	Kongsberg DPS-3 rated for water depths up to 12,000 ft.

Cranes

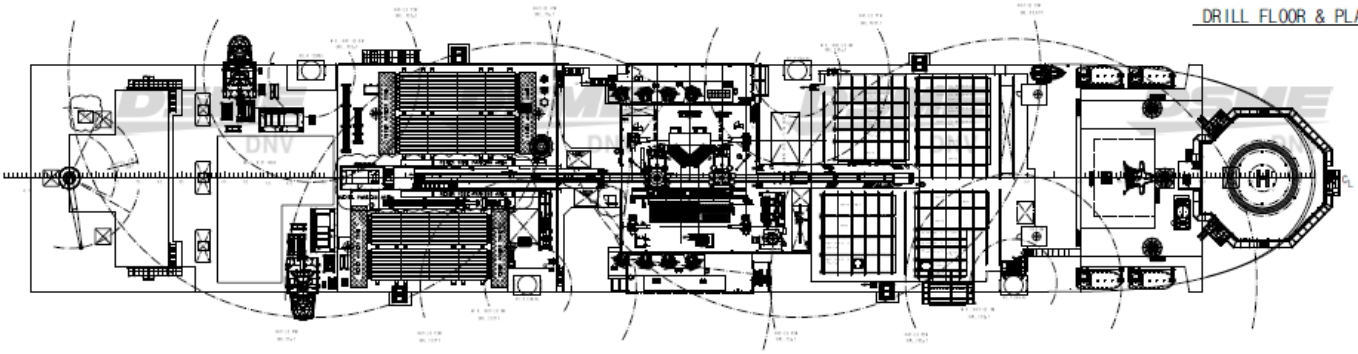
Cranes	3 x 110 st NOV knuckle-boom cranes model OC4000KCE with semi-automated riser and tubular handling attachments.
AHC Subsea Crane	1 x 181 st NOV Active Heave Compensation knuckle-boom boom crane for handling subsea equipment up to 12,000 ft WD.

Other Information

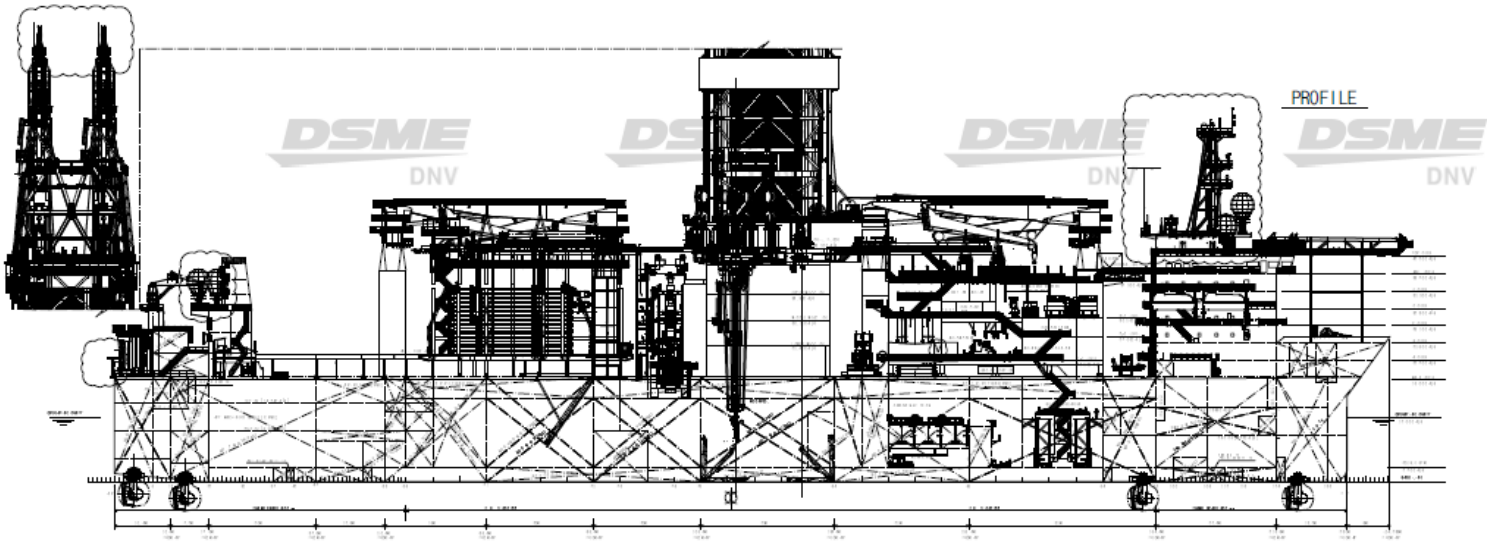
Helideck	Rated for Sikorsky S-61 & S-92 helicopters.

Revision Date: 29 August 2014

DRILL FLOOR & PLAN VIEW



PROFILE



PRE DEPARTURE CHECKLIST

☐ ***Has a passage plan for the intended voyage been prepared?***

Has the following equipment been checked and found ready for use?

☐ anchors
☐ rough Bridge log
☐ electronic navigational position fixing systems (GPS)
☐ gyro/magnetic compass and repeaters
☐ passage plan entered into the integrated bridge system
☐ radars / ARPA
☐ echo sounder
☐ required AIS data inputs made, speed/distance recorder
☐ clocks

Has the following equipment been tested, synchronized and found ready for use?

☐ ***Bridge controls, including***
☐ IAS control
☐ Thrusters' controls and indicators
☐ Thrusters' RPM and Azimuth indicators
☐ ***communication facilities, including***
☐ Bridge / ECR / Mooring Stations communications
☐ Portable radios
☐ VHF radio communications with port authority
☐ ***navigation and signal lights, including***
☐ search lights
☐ signaling lamp
☐ morse light
☐ ***Sound signaling apparatus, including***
☐ whistles
☐ fog bell and gong system
☐ **Steering gear, Auto-Pilot and Changeover arrangements**
☐ **Window wiper/clear view screen arrangements**

Is the ship secure for sea?

☐ equipment and stores secured?
☐ all hull openings secure and watertight?
☐ stability and Draft information available?
☐ Details of all persons on board available?
☐ Moonpool Flap Secure
☐ Nothing in the water in moonpool
☐ Fenders retrieved and secure
☐ Hoses out of water
☐ ROV cursor rails secure and any speed restrictions

PRE ARRIVAL CHECKLIST

☐ ***In preparing the passage for the arrival in port, it may be necessary a pre-pilotage information exchange take place?***

☐ ***Has the passage plan been updated following receipt of the Shore-to Ship Pilot/Master Exchange form and all the latest navigational warnings?***

☐ ***Has the ETA been sent with all relevant information required by local regulations?***

☐ ***Is it necessary to rearrange cargo/ballast?***

Has the following equipment been prepared and checked?

☐ course recorder
☐ clock synchronization
☐ communications with the mooring stations
☐ signaling equipment, including flags/lights
☐ deck lighting
☐ mooring winches and lines, including heaving lines
☐ pressure on fire main
☐ anchors cleared away

☐ ***Has the steering gear been tested, and has manual steering been engaged in sufficient time for the helmsman to become accustomed before manoeuvring commences?***

☐ ***Have the engines and thrusters been tested and prepared for manoeuvring?***

☐ ***Has the Pilot Card been completed and are the pilot embarkation arrangements in hand?***

☐ ***Have VHF channels for the various services (e.g. VTS, pilot, tugs, berthing instructions) been noted and a radio check carried out?***

☐ ***Has the port been made fully aware of any special berthing requirements that the ship may have?***

PILOTAGE

☐ ***Immediately on arrival on the Bridge, has the pilot been informed of the ship's heading, speed, thruster settings and draught?***

☐ ***Has the pilot been informed of the location of the lifesaving appliances provided on board for his use?***

Have details of the proposed passage plan been discussed with the pilot and agreed with the Master, including:

☐ radio communications and reporting requirements
☐ bridge watch and crew stand-by arrangements
☐ deployment and use of tugs
☐ berthing/anchoring arrangements
☐ expected traffic during transit
☐ pilot change-over arrangements, if any
☐ fender requirements

☐ ***Has a completed Pilot Card been handed to the pilot and has the pilot been referred to the Wheelhouse poster?***

☐ ***Have the responsibilities within the bridge team for the pilotage been defined and are they clearly understood?***

☐ ***Has the language to be used on the bridge between the ship, the pilot and the shore been agreed?***

☐ ***Are the progress of the ship and the execution of orders being monitored by the Master and officer of the watch?***

☐ ***Are the engine room and ship's crew being regularly briefed on the progress of the ship during pilotage?***

☐ ***Are the correct lights, flags and shapes being displayed?***

PASSAGE PLAN APPRAISAL

Have navigation charts been selected from the chart catalogue, including:

- ☐ large scale charts for coastal waters
- ☐ appropriate scale charts for ocean passages
- ☐ planning charts
- ☐ routeing, climatic, pilot and load line zone charts

Have publications been selected, including:

- ☐ Sailing Directions and pilot books
- ☐ light lists
- ☐ radio signals
- ☐ guides to port entry
- ☐ tidal tables and tide stream atlas

Have all navigational charts and publications been corrected up to date, including:

- ☐ the ordering of new charts/publications, if necessary
- ☐ notices to mariners
- ☐ local area warnings
- ☐ NAVAREA navigational warnings

Have the following been considered?

- ☐ ship's departure and arrival draughts together with any restrictions on under keel clearance
- ☐ ship's cargo and any special cargo stowage/carriage restrictions
- ☐ if there are any special ship operational requirements for the passage

Have the following been checked?

- ☐ planning charts and publications for advice and recommendations on route to be taken
- ☐ climatological information for weather characteristics of the area
- ☐ navigation charts and publications for landfall features
- ☐ navigation charts and publications for Ship's Routeing Schemes, Ship reporting Systems and Vessel Traffic Services (VTS)

☐ ***Has the weather routeing been considered for passage?***

Have the following preparations been made for port arrival?

- ☐ navigation charts and publications studied for pilotage requirements
- ☐ Ship-to-Shore Master/Pilot Exchange form prepared
- ☐ pilot card updated
- ☐ port guides studied for port information including arrival/berthing instructions

NAVIGATION IN COASTAL WATERS

Have the following factors been taken into consideration in preparing the passage plan?:

- ☐ advice/recommendations in Sailing Directions
- ☐ ship's draught in relation to the available water depths
- ☐ under keel clearance in shallow water
- ☐ tides and currents
- ☐ weather, particularly in areas prone to poor visibility
- ☐ available navigational aids and their accuracy
- ☐ position-fixing methods to be used
- ☐ daylight/night-time passing of danger points
- ☐ traffic likely to be encountered – flow, type, volume
- ☐ any requirements for traffic separation/routeing schemes
- ☐ ship security considerations regarding piracy or armed attack

☐ ***Are local/coastal warning broadcasts being monitored?***

☐ ***Is participation in area reporting systems recommended including VTS?***

☐ ***Is the ship's position being fixed at regular intervals?***

Has the equipment been regularly checked/tested, including:

- ☐ gyro/magnetic compass errors
- ☐ manual steering before entering coastal waters if automatic steering has been engaged for a prolonged period
- ☐ radar performance and radar heading line marker alignment
- ☐ echo sounder

☐ ***Is the OOW prepared to use thrusters and call a look-out or a helmsman to the Bridge?***

☐ ***Have all measures been taken to protect the environment from pollution by the ship and to comply with applicable pollution regulations?***

FAMILIARISATION WITH BRIDGE EQUIPMENT

Has the operation of the following equipment been studied and fully understood?

- ☐ ***bridge and deck lighting***
- ☐ ***emergency arrangements in the event of main power failure***
- ☐ ***navigation and signal lights, including***
- ☐ searchlights
- ☐ signaling lights
- ☐ morse light
- ☐ ***sound signaling, including***
- ☐ whistles
- ☐ fog bell and gong system
- ☐ ***safety equipment, including***
- ☐ LSA equipment including pyrotechnics, EPIRB and SART
- ☐ K-Safe fire detection system
- ☐ general alarm and fire alarm signaling arrangements
- ☐ fire pumps, ventilation and watertight door controls
- ☐ ***Internal ship communication equipment, including***
- ☐ portable radios
- ☐ sound powered phones
- ☐ talk-back system
- ☐ public address system
- ☐ ***AIS and external communication equipment, including***
- ☐ VHF and GMDSS equipment
- ☐ ***Alarm systems on Bridge***
- ☐ ***automatic track-keeping system***
- ☐ ***ECDIS and electronic charts***
- ☐ ***echo sounder***
- ☐ ***electronic navigational position-fixing systems***
- ☐ ***VDR equipment***
- ☐ ***gyro compass/repeaters***
- ☐ ***magnetic compass***
- ☐ ***off-course alarm***
- ☐ ***radar including ARPA***
- ☐ ***speed/distance recorder***
- ☐ ***engine and thruster controls***

CHANGING OVER THE WATCH

When changing over the watch relieving officers should personally satisfy themselves regarding the following:

- ☐ standing orders and other special instructions of the Master relating to navigation of the ship
- ☐ position, course, speed and draught of the ship
- ☐ prevailing and predicted tides, currents, weather, and visibility and the effect of these factors upon course and speed
- ☐ procedures for the use of engines and thrusters to manoeuvre and the status of the watch keeping arrangements in the engine room
- ☐ the ship security status
- ☐ sufficient time has been allowed for night vision to be established and that such vision is maintained
- ☐ navigational situation, including but not limited to:
- ☐ the operational condition of all navigational and safety equipment being used or likely to be used during the watch
- ☐ the errors of the gyro and magnetic compasses
- ☐ the presence and movements of ships in sight or known to be in the vicinity
- ☐ the conditions and hazards likely to be encountered during the watch
- ☐ the possible effects of heel, trim, water density and squat on under keel clearance
- ☐ any special deck work in progress

NAVIGATION IN RESTRICTED VISIBILITY

Has the following equipment been checked to ensure that it is fully operational?

- ☐ radar, ARPA, or other plotting facilities
- ☐ VHF
- ☐ fog signaling apparatus
- ☐ echo sounder, if in shallow waters
- ☐ watertight doors

☐ ***Have look-out(s) been posted and is the helmsman on standby?***

☐ ***Has planning allowed for the provision of additional bridge team personnel if required?***

☐ ***Has the Master been informed and all available engines/thrusters made ready?***

☐ ***Are the COLREGS being complied with, particularly with regard to Rule 19 and proceeding at a safe speed?***

☐ ***Is the ship ready to reduce speed, stop or turn away from danger?***

☐ ***If the ship's position is in doubt, has the possibility of anchoring been considered?***