

共享技术进步 受益增值服务

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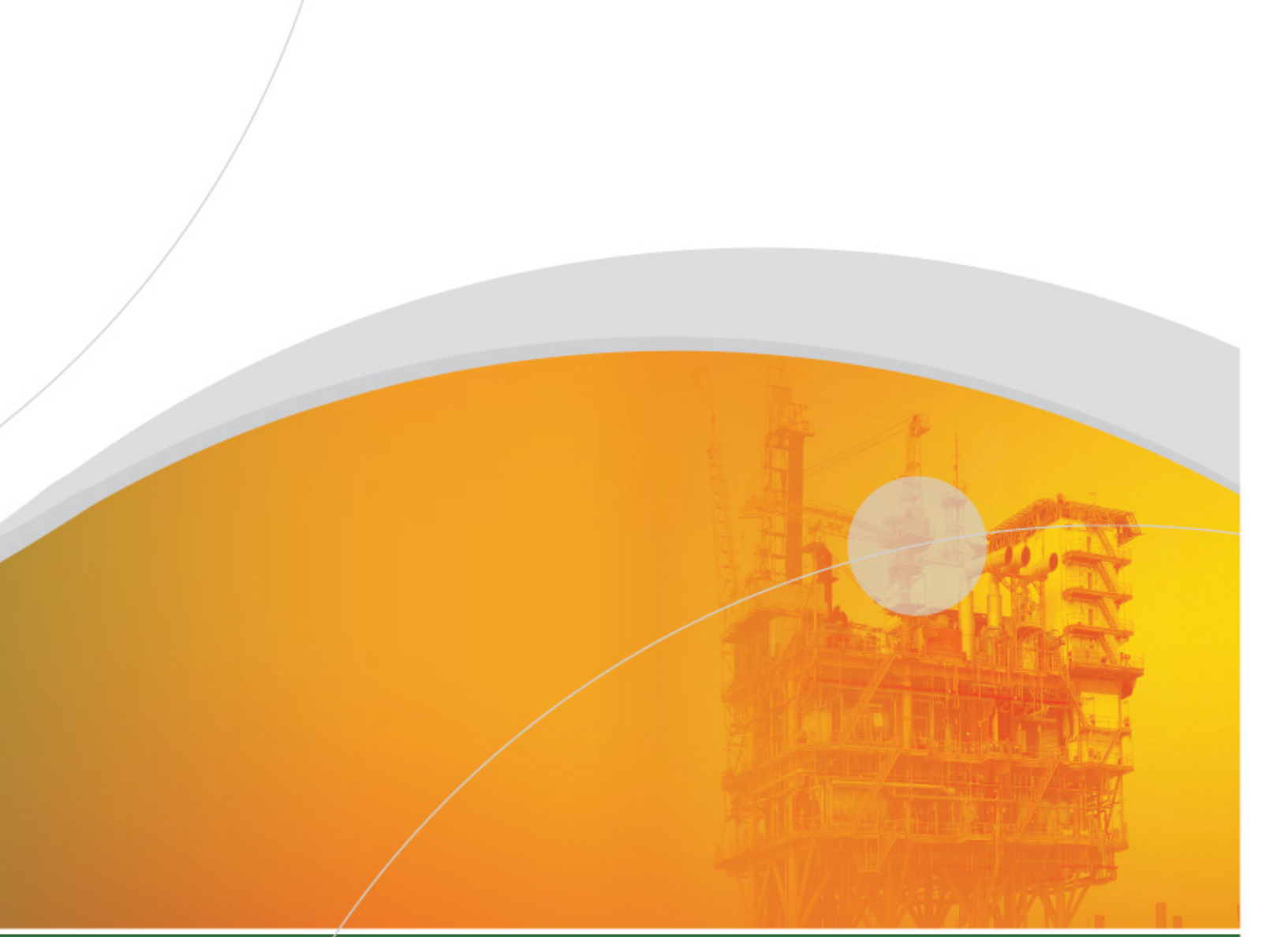
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Offshore Facility Assessment

Offshore Facility Assessment

INTRODUCTION

Based on the inspection result from 100% overall visual inspection, thickness measurement, ROV, NDT test, thickness measurement of marine growth, coating thickness and CP reading, sea bottom investigation, boat landing facilities inspection, platform inclination measurement, deformation, dent and damage measurement for key structure, etc; the engineer will use the special offshore structure analysis program to set up a 3-D FEM computer model in accordance with the design parameters as well as thickness gauging and NDT testing results. Using this model, the engineer will calculate and analyze the static and dynamic global strength of the structure, stiffness, fatigue life, tubular joint, pile-soil stress etc. Based on the established computer model for safety assessment, CCS can provide long-term technical support services for the owner covering the whole service life. CCS will trace the utilizing and periodic inspections results and update the computer model accordingly. If the owner needs such an urgent technical support during repairing, modifying and damage, CCS will respond at the earliest possible time based on the established and updated computer model, which will obviously be of great benefit to the owner.



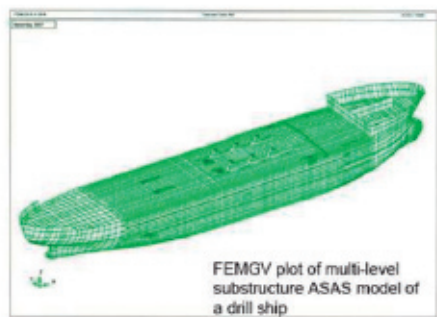
TARGETS AND CONTENTS OF ASSESSMENT

1. Assessment of global structural strength, local structural strength, punch shear check for tubular joints, pile maximum bearing capacity, crack risk and residual longevity for the fixed platform in all cases, which includes simple platform, jacket platform, tension leg platform, compliant tower and single point mooring platform.
2. Assessment of global structural strength, local structural strength, hydrodynamic action, crack risk, residual longevity, and calculation of intact, damage, capsizal-resistance, up and downs as well as skid-resistance stability for the mobile platform in all cases, which includes jack-up platform, bottom sitting platform, column stabilized platform, ship platform.
3. Assessment of global structural strength, local structural strength, hydrodynamic action, crack risk, residual longevity, and calculation of intact, damage stability and load line for FPSO.
4. Calculation of global structural strength, local structural strength and fatigue damage for the subsea pipeline.
5. Calculation of cable tension, cable length, fatigue longevity and anchor holding capacity for the mooring system in the integrated case and the damaged case.
6. Assessment of global structural strength, local structural strength and fatigue failure for other offshore constructions, for example, underwater robot, deep submersible vehicle and so on.

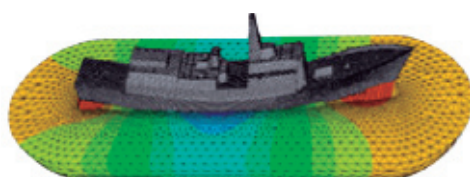
LIST OF COMPANIES FOR WHICH CCS HAS PROVIDED ASSESSMENT OF OFFSHORE FACILITIES

- ⊙ CHINA NATIONAL PETROLEUM CORPORATION
- ⊙ CHINA NATIONAL OFFSHORE OIL CORPORATION
- ⊙ OFFSHORE OIL ENGINEERING LIMITED CORPORATION
- ⊙ AMERICAN ConocoPhillips CORPORATION
- ⊙ BP AMOCO CORPORATION
- ⊙ AMERICAN DEVON ENERGY CORPORATION

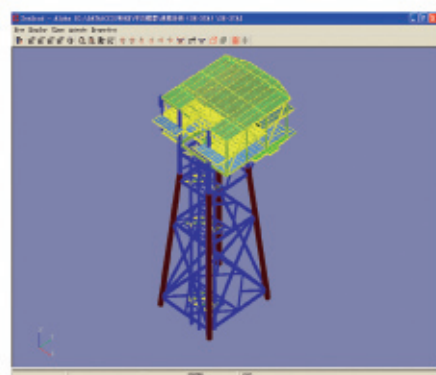
- ⊙ CHINA PETROCHEMICAL CORPORATION
- ⊙ CHINA OILFIELD SERVICES LIMITED CORPORATION
- ⊙ AMERICAN NATIONAL OILWELL CORPORATION
- ⊙ BP CORPORATION
- ⊙ CACT OPERATORS GROUP



ANSYS ASAS Software



ABAQUS Software



STRUCAD Software

INTRODUCTIONS TO SOFTWARES OWNED BY CCS FOR OFFSHORE FACILITY ASSESSMENT

1. Common softwares for structural strength calculation

⊙ ANSYS is a large comprehensive finite element analysis (FEA) software, which is vastly applied to the mechanical, fluid, electromagnetic areas and so on. It can make linear and non-linear analysis of a structure, and analyze the static, dynamic and transient motion characters. In the offshore area, it can complete the static and dynamic analysis of the jacket platform and mobile platform when having been combined with calculation softwares for the environmental loads, for example, AQWA and WAMIT. It has multiple interfaces with CAD softwares, strong capacity of modelling structure, and is fit for detailed analysis of the structure.

⊙ ABAQUS is similar to ANSYS, which is a comprehensive FEA software. In comparison with ANSYS it has the AQUA module, which can calculate environmental loads of tubular construction, and the PILE-SOIL element, which can model interaction between pile and soil. It has stronger non-linear modelling capacity than ANSYS and can complete detailed analysis of the jacket platform by itself. It needs other calculation software of environmental loads if it applies to outsize platform.

⊙ NASTRAN is also a large comprehensive FEA software, which has an interface with the special softwares developed by CCS.

2. Special software for offshore facility

⊙ SACS is a special software for offshore construction that has been employed by 300 professional corporations all around the world, which can complete the static, dynamic, and fatigue analysis of offshore construction. It can make verification of calculation results to requirements of some codes, for example, API RP 2A.

⊙ STRUCAD is similar to SACS, which is fit for structural analysis of the jacket platform, and can make verification of calculation results to requirements of some codes.

3. Calculation softwares for environmental loads and stability

⊙ AQWA is a calculation software for hydrostatic and hydrodynamic force of the large scale buoyant hull. The hydrodynamic calculation includes analysis in time domain and frequency domain. The software can analyze coupling response of the buoyant hull with the mooring system, and simulate launch and floatation of the jacket.

⊙ STABCAD is a special software for stability calculation.

⊙ NEPTUNE is a hydrostatic and hydrodynamic calculation software for the large scale buoyant hull, and has an interface with STRUCAD. It has rapid calculation speed.

4. Calculation softwares for subsea pipeline and mooring system

⊙ PIPELINE is a software for subsea pipeline design.

⊙ ZENMOOR is a software for mooring system design.

⊙ FLEZRISER is a software for rise design.