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GP 66-00

Structural Integrity Management System (SIMS)

Group Practice

**BP GROUP
ENGINEERING TECHNICAL PRACTICES**

Foreword

BP has developed standard documentation, including guidelines and specifications, in support of a common Structural Integrity Management (SIM) process. Much of the underlying technical basis supporting the development of SIM documentation has resulted from past research and development studies conducted by BP and its nominated specialist consultants.

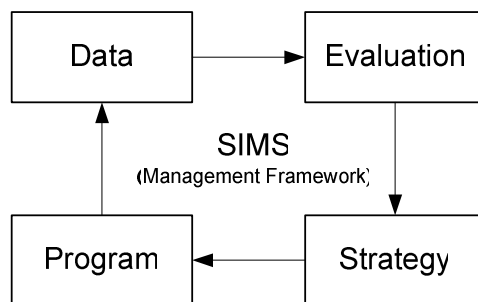
The SIM process includes a library of standard documentation to assist SPU's in their SIM implementation, including specifications and guideline documents listed in Section 2. This Group Practice (GP) requires that a SIM process be established for all offshore fixed structures. The process can be applied to one facility or to a fleet of facilities.

The SIM process described in this GP can be applied to all onshore and offshore structures, but the content and industry references in this GP focus on fixed offshore structures. The requirements, however, are similar for floating structures, onshore, and near-shore structures.

Effective Structural Integrity Management (SIM) improves operational performance through enhanced health, safety, security, environmental performance and business performance through increased availability of the facility. It also provides the means for better identification of structural risks which can then be managed and reduced in a cost effective and consistent manner. This enhances BP's privilege to operate and supports the objective of being a responsible operator.

This Engineering Technical Practice (ETP) GP 66-00 has the title of Structural Integrity Management System (SIMS), to emphasize the need for the SIM process to be supported by an effective management system in order to implement and deliver structural integrity. This is illustrated in Figure 1.

Figure 1 - BP SIM process supported by SIMS



Experience has shown that implementation of a SIM process in an SPU cannot be fully achieved without the use of assigned experienced people in BP Operations, including specialized contractors

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and consultants. Clear roles and accountabilities are required with appropriate levels of competencies for the tasks involved. Key personnel requirements, competencies, and management framework are described in this GP. Each SPU is required to develop their own organization chart as part of their SIMS STP.



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1. Scope

- a. This Group Practice (GP) assists SPUs in implementation and delivery of the SIM process for fixed offshore structures in accordance with the requirements of:
 1. Integrity Management Standard (IM Practice).
 2. Integrity Management Standard: Implementation in E&P (IM Guide).
 3. Assessment, prioritization and management of risk (GDP 3.1-0001).
- b. This GP defines the SIM process which is applicable to all BP offshore fixed structures. The content and industry references focus on the structural elements of an offshore fixed structure (piles, substructure, topsides modules, etc.).

The SIM system described here is equally appropriate for onshore and floating structures. This GP is aligned with the requirements of industry standards API RP 2SIM and ISO 19902 which primarily relate to offshore platform substructures. For offshore topsides, onshore structures, floating structures and near-shore structures the appropriate industry codes should be addressed and aligned with this GP.

2. References

2.1. Normative

The following referenced documents may, to the extent specified in subsequent clauses and normative annexes, be required for full compliance with this GP:

- For dated references, only the edition cited applies.
- For undated references, the latest edition (including any amendments) applies.

American Petroleum Institute (API)

API RP 2A-WSD 21st Ed. Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design.

International Standards Organisation (ISO)

ISO 19902 Petroleum and natural gas industries - Fixed steel offshore structures.

2.2. Informative

GP 32-30	Inspection and Testing of Equipment in Service - Management Principles.
GP 66-XX0	Structural Risk Management.
GN 32-011	Onshore Facility Inspection Specification.
GN 32-012	Civil and Structural Inspection Using RBI.
GN 66-110	Project Requirements for Structural Integrity Management (SIM).
GN 66-200	Performance Based Design (PBD).
GN 66-260	Fire and Blast Structural Loading and Response.
GN 66-420	Platform Assessment Engineering Methodology.
GN 66-600	Risk Based Underwater Inspection (RBUI).
GN 66-620	Underwater Platform Inspection Specification.
GN 66-640	Above-water Platform Inspection Specification.



GN 66-660	Post Event and Special Inspection Specification.
GN 66-900	Strengthening, Modification and Repair Technology (bpSMART).
GN 66-920	Structural Applications for FRP Specification.

3. Symbols and abbreviations

For the purposes of this document, the following symbols and abbreviations shall apply:

bpFMS	BP Fleet Management System.
BCE	Business Critical Equipment.
CVI	Close Visual Inspection.
EA	Engineering Authority.
EPT	Exploration and Production Technology.
E&P	Exploration and Production.
FP	Focal Point.
GOM	Gulf of Mexico.
GVI	General Visual Inspection.
HiPo	High Potential Incident.
HSE	Health, Safety and Environment.
IA	Inspection Authority.
IE	Integrity Engineer.
ISIP	In Service Inspection Plan.
KPI	Key Performance Indicator.
MAR	Major Accident Risk.
MIA	Major Incident Announcement.
MOC	Management of Change.
NDE	Non Destructive Examination.
PU	Performance Unit.
RBUI	Risk Based Underwater Inspection.
SCE	Safety Critical Equipment.
SETA	Segment Engineering Technical Authority.
SIM	Structural Integrity Management.



SIMS	Structural Integrity Management System.
SMR	Strengthening, Modification and Repair.
SPA	Single Point Accountability.
SPU	Strategic Performance Unit.
STP	Site Technical Practice.
TA	Technical Authority.

4. General

- a. Each SPU shall ensure that the approach taken for SIM is consistent with the Group OMS Framework, especially the IM Practice and IM Guide, together with the Group defined operating practice for assessment, prioritization and management of risk.
- b. When using this ETP, all local and national regulatory requirements shall still be met. This document shall be read in conjunction with BP Group Policies and Standards as well as applicable Engineering Technical Practice documents and Guidance Notes.

The SIM process described in this GP:

- *Has been developed around internationally recognised industry standards, including ISO and API.*
 - *Uses BP developed know how and industry best practices to enable BP operations to benefit from a) Reduced risks to integrity and health, safety and environment (HSE); b) Increased life cycle value; c) Improved engineering standardisation and productivity and d) Lessons learned captured by other parts of the organisation.*
- c. The SIM process requires a management system (i.e., a SIMS, STP) which provides an auditable framework to demonstrate fitness for purpose for continued operation of offshore and onshore structures.

5. Elements of structural integrity management

5.1. Accountabilities

- a. There shall be an identifiable SIM organisation dedicated to the structural assets in the SPU. The SIM process shall be a live, ongoing process from design through to decommissioning. Key factors for success should include:
 1. Ownership at the highest level within the SPU/PU.
 2. Continuous support and input from all levels across the organisation.
 3. Clarity on roles and responsibilities.
 4. Competency of personnel to develop and meet the SIMS requirements.
 5. Open and regular communication and engagement of personnel across all areas for integrity.
 6. Allocation of sufficient funds and resources to deliver.
- b. The person with SPA for integrity management in the SPU shall ensure that clear roles and responsibilities are established for setting up and operating an effective SIMS together with appropriate budget and support arrangements in order to deliver the requirements of



the SIM process. The SPA shall also ensure that an annual SIM review is carried out to confirm that all the structures are fit for continued operation. The process of annual review shall be the responsibility of the SPU structural TA and is outlined in Annex A.

- c. The SPU structural TA defines the technical requirements of SIM for the SPU and drives the SPU SIM process. The TA shall be accountable to the EA and shall:
 1. Ensure that all aspects of structural integrity are considered and assessed.
 2. Ensure that structural risks are identified and mitigation recommendations are developed. Furthermore, the TA will ensure that these risks are visible to SPU management.
 3. Ensure that regular communications are maintained across groups involved in the SIM process.
 4. Ensure that the SIM process is fully carried out and recommendations with regard to structural integrity are reviewed, adopted and implemented. The TA shall also track the implementation / closure of these recommendations.
 5. Ensure that all MOCs with structural implications are identified, reviewed, and signed off by the structural TA or his / her delegate.
 6. Conduct an annual SIM review (see Annex A) and develop an Annual Summary Report (ASR) (see Annex C) for the EA and SPA.
 7. Arrange audits of the SPU SIMS.
 8. Ensure that structural discipline engineers within the SPU are fully connected to the Pipeline & Civil Engineering Discipline Network.
 9. Review the competency and roles and responsibilities of those in the SPU structural engineering discipline; including those in Major Projects. This will be done on behalf of the EA with assistance from the SETA, as required.
 10. Define the appropriate activities needed to demonstrate regulatory compliance with regards to structures. More exhaustive periodic reviews may be required by the regulator, especially if the structure is to be operated beyond original design life.

Having a good SIM process with approved BP tools such as bpFMS (see Annex D) greatly facilitates annual and periodic reviews.
- d. The SPU structural FP provides a project management role to deliver SIM in accordance with the technical requirements outlined by the SPU TA. The structural FP shall also provide the required level of access to BP facilities and resources for the IE to perform his/her role. The structural FP shall:
 1. Coordinate with SIM stakeholders in order to establish a budget and plan to implement SIM requirements in-line with the TA's requirements and agreed SPU SIMS documentation.
 2. Ensure that all structural risks are communicated to the TA and that they are managed. The FP will ensure a plan is in place to remove or reduce the risk to an acceptable level in an agreed timeframe or ensure suitable mitigation measures are instigated. The FP shall work closely with the TA on structural integrity issues to ensure BP best practice is engaged at all times and that MOC issues pertaining to SIM are captured in the annual delivery process.
 3. Be responsible for managing interfaces to each of the SIMS contractor organisations for inspection, testing and repair. The FP may appoint delegates to project manage specific activities of the SIMS contractor organisations as required.
 4. Liaise with operations representatives to ensure that SIMS activities are coordinated with asset operations and executed in a safe manner.

