

UNITED STATES DEPARTMENT OF THE INTERIOR
MINERALS MANAGEMENT SERVICE

NTL No. 98-1N

Effective Date: January 2, 1998

NOTICE TO LESSEES AND OPERATORS OF FEDERAL OIL, GAS, AND SULPHUR
LEASES IN THE OUTER CONTINENTAL SHELF

Interim Guidance for Applying Platform Design Criteria from American Petroleum Institute (API) Recommended Practice 2A (RP 2A), "Planning, Designing, and Constructing Fixed Offshore Platforms," Nineteenth Edition (August 1, 1991) and Twentieth Edition (July 1, 1993) and its Supplement 1 (February 1, 1997)

The API chartered the Task Group on Consequence Based Design Criteria to develop recommendations for the design criteria of new Gulf of Mexico platforms based upon intended service levels and performance requirements for different classes of platforms. The Task Group reviewed the current and all past Editions of API RP 2A. They found that design loads recommended in the 9th through 19th Editions were essentially unchanged and resulted in a history of favorable platform experience during the past 20 years. The majority of this favorable experience was for platforms located in waters less than 400 feet deep.

The Task Group noted that the 20th Edition includes revisions to the methods and criteria used to compute design loads that incorporate the latest theoretical understanding and data; therefore, resulting maximum design loads from the 20th Edition are generally higher and thus more conservative than those from the 19th Edition and earlier Editions.

Furthermore, the Task Group identified situations where, in their judgment, neither the 19th nor 20th Edition of API RP 2A provides adequate design guidance. They therefore provided interim recommendations to the Minerals Management Service (MMS) which included the following:

1. Beyond 400 feet of water depth, all fixed platforms should be designed to the 20th Edition of API RP 2A, regardless of what Level of structure they may be--1, 2, or 3.
2. For all Level 1 structures, *only* the 20th Edition of API RP 2A should be used.
3. For Level 2 and Level 3 structures in water depths of less than 400 feet, either the 19th or 20th Edition of API RP 2A is acceptable.
4. For all Wind-Dominated Platforms, both the 19th and 20th Editions must be modified to compute the wind design load criteria using *the 1-minute wind speed* in place of the 1-hour wind speed.
5. The modifications noted in Table A-1 below for "Platforms with Less than 4 Legs," "Minimum Platforms," and "Wind-Dominated Platforms" should be applied to the API RP 2A design criteria.

Table A-1 below summarizes the recommendations of the API Task Group on Consequence Based Design Criteria. The MMS will apply these recommendations in its reviews of

applications for approval concerning all new platforms on any area of the Outer Continental Shelf.

Table A-1. Interim Design Criteria for New Platforms as Specified by the API Task Group

Platform Type	Exposure Categories	
	LEVEL 1	LEVEL 2 & LEVEL 3
Platforms with 4 or More Legs	API RP 2A 20 th Edition must be applied, regardless of water depth.	API RP 2A 20 th Edition must be applied <i>for water depths over 400 feet</i> , but API RP 2A 19 th Edition may be used if water depths are less than 400 feet.
Platforms with Less than 4 Legs and “Minimum Platforms” as defined in Section 1.6.5 of API RP 2A 20 th Edition, Supplement 1	API RP 2A 20 th Edition must be applied, but API RP 2A 20 th Edition must be modified to produce an omnidirectional design load criterion equal to that of the peak direction. That is, take the maximum load criterion from any direction and use that load criteria for all directions--use Figure 2.3.4-4 in API RP 2A 20 th Edition with all factors = 1.0.	API RP 2A 20 th Edition must be applied <i>for water depths over 400 feet</i> , but API RP 2A 20 th Edition must be modified to produce an omnidirectional design load criterion equal to that of the peak direction. That is, take the maximum load criterion from any direction and use that load criteria for all directions--use Figure 2.3.4-4 in API RP 2A 20 th Edition with all factors = 1.0. OR, <i>If water depths are less than 400 feet, API RP 2A 19th Edition may be used.</i>
Wind-Dominated Platforms	API RP 2A 20 th Edition must be modified to compute the wind design load criteria using <i>the 1-minute wind speed</i> in place of the 1-hour wind speed.	API RP 2A 20 th Edition must be modified to compute the wind design load criteria using <i>the 1-minute wind speed</i> in place of the 1-hour wind speed. OR, <i>If water depths are less than 400 feet, API RP 2A 19th Edition may be used, but it must be modified to compute the wind design load criteria using the 1-minute wind speed in place of the 1-hour wind speed.</i>

The Task Group’s recommendations are contained in a **letter** to MMS dated July 28, 1997, and an amended **Table 1**, sent to MMS on December 10, 1997. Both are included with this NTL as **Attachment 1**. According to the Task Group, both the **Platform Type** and the **Exposure Categories** should be considered in selecting the design criteria for new platforms. Exposure Categories are defined in Supplement 1 to API RP 2A-WSD, 20th Edition (February 1, 1997).

FUTURE APPLICABILITY

The API Task Group on Consequence Based Design Criteria is continuing its work to distinguish between Level 2 and Level 3 Platform characteristics and develop different design criteria for Level 3 Platforms. The Task Group expects to complete its work in 1997, which will lead to a formal revision to API RP 2A in 1998 and further recommendations to MMS. Until that work is completed, the MMS believes that the design criteria presented above and in **Attachment 1** will best serve the interests of safe operations for offshore oil and gas lessees and operators and their employees. This interim guidance will remain in effect until the 21st Edition of API RP 2A is incorporated by reference into MMS operating regulations.

BACKGROUND

The 19th edition of API RP 2A, "Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Platforms" (dated August 1, 1991) was incorporated by reference into 30 CFR 250 when the Minerals Management Service (MMS) issued a Federal Register Notice of November 26, 1996 (Vol. 61, No.229, Pages 60019-26). MMS is preparing a rule that would also incorporate by reference into 30 CFR 250 the 20th Edition of API RP 2A and its Supplement 1.

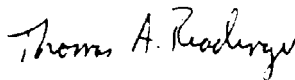
MMS regulations (30 CFR 250.1) allow a lessee to use a later edition of a specific document incorporated by reference provided (1) that the lessee demonstrates that compliance with the later edition provides a degree of protection, safety, or performance equal to or better than that which would be achieved by compliance with the listed edition and (2) that the lessee obtains prior written approval of the authorized MMS official.

Also, MMS regulations concerning use of "Best available and safest technologies (BAST)" (30 CFR 250.22) state in paragraph (a) that BAST are required "where ever failure of equipment would have a significant effect on safety, health, or the environment, except where the Director determines that the incremental benefits are clearly insufficient to justify the incremental costs of utilizing such technologies." Paragraph (b) of this section states that "Conformance to the standards, codes, and practices referenced in this part will be considered to be the application of BAST."

MMS regulations under Subpart I--Platforms and Structures--at 30 CFR 250.130 require in paragraph (a) that "The lessee shall design, fabricate, install, use, inspect, and maintain all platforms and structures . . . to assure their structural integrity for the safe conduct of drilling, workover, and production operations, *considering the specific environmental conditions at the platform location.*" (Emphasis added.) MMS encourages operators to read sections 30 CFR 250.1, 250.3, 250.22, and 250.130 of our regulations.

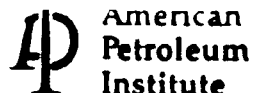
This Notice to Lessees and Operators refers to information collection requirements in 30 CFR 250, subparts A and I. The Office of Management and Budget has approved the collection of information in these regulations and has assigned OMB Control Numbers 1010-0030 and 1010-0058, respectively. This Notice to Lessees and Operators does not impose additional information collection requirements subject to the Paperwork Reduction Act of 1995.

Your comments are important. The Small Business and Agriculture Regulatory Enforcement Ombudsman and 10 Regional Fairness Boards were established to receive comments from small businesses about federal agency enforcement actions. The Ombudsman will annually evaluate the enforcement activities and rate each agency's responsiveness to small business. If you wish to comment on the actions of MMS call 1-888-REG-FAIR (1-888-734-3247).



for Carolita U. Kallaur
Associate Director
for Offshore Minerals Management

Committee Correspondence



1220 L Street, Northwest
Washington, DC 20005-4070
202-682-8000

Attachment 1

July 28, 1997

Mr. Elmer P. Danenburger
Minerals Management Service
Engineering and Operations Division Chief
381 Elden Street, Mail Stop 4700
Herndon, VA 20170

Dear Mr. Danenburger:

SUBJECT: Recommendations for Platform Design Criteria in the Gulf of Mexico

MMS has announced that the 19th Edition of API RP 2A "Recommended Practice for Planning, Designing, And Constructing Fixed Offshore Platforms" (dated August 1, 1991) has been incorporated by reference in 30 CFR 250 and must now be used in designing and constructing new platforms. On behalf of the API's Subcommittee on Offshore Structures, we recommend that design criteria for new platforms in the Gulf of Mexico be based on recommendations contained in both the 19th Edition of API RP 2A and the 20th Edition of API RP 2A (dated July 1, 1993) and its Supplement 1 (dated February 1, 1997) as described below. This is an interim recommendation based upon work being done by an API RP 2A Task Group on Consequence Based Design Criteria. We expect the Task Group to complete its work later this year, which will lead to a formal revision to API RP 2A in 1998 and further recommendation to the MMS. We believe that this interim recommendation will serve the interests of the MMS and the offshore oil and gas operators better than the current regulations.

Background. The Task Group on Consequence Based Design Criteria was chartered to develop recommendations for the design criteria of new Gulf of Mexico platforms based upon intended service levels and performance requirements for different classes of platforms. Their studies have reviewed the 20th Edition design criteria along with the 19th (and earlier) Edition design criteria. The 20th Edition includes revisions to the methods and criteria used to compute design loads that incorporate the latest theoretical understanding and data. Notably, currents, current blockage, wave directional spreading, and wave directionality are explicitly included. The resulting maximum design loads from the 20th Edition are generally higher and thus more conservative than those from the 19th (and earlier) Editions. However, design loads recommended in the 9th through 19th Editions were essentially unchanged, and resulted in a history of favorable platform experience over the last 20 years. The majority of this favorable experience was for platforms in water depths less than 400 feet.

Recommendation

Both the **Exposure Category** and the **Platform Type** should be considered in selecting the design criteria for new platforms in the Gulf of Mexico. Exposure Categories are defined in Supplement 1 to API RP 2A-WSD, 20th Edition (February 1, 1997). A summary of key points follows.

Exposure Categories. Platforms can be categorized by various levels of exposure to determine appropriate design criteria for new platforms. Considerations of both life-safety and the consequences of failure determine these levels. Life-safety considers the maximum environmental event that would be expected to occur while personnel are on the platform. Consequences of failure considerations include such factors as anticipated losses to the platform owner (e.g., repair, replacement, cleanup, lost production), anticipated losses to other operators (e.g., lost production through trunklines), and anticipated losses to the industry at large and the government. Three Levels are considered for each life safety and consequence of failure. The more restrictive of either the life safety or consequence of failure considerations determines the Level to be used in determining the appropriate design criteria. Three Levels result, **Level 1, Level 2, and Level 3**, with Level 1 requiring the most stringent design criteria.

Level 1 Platforms. Level 1 Platforms are permanently manned and not evacuated prior to the design environmental event, e.g. a hurricane. These platforms have high consequences of failure, in that they are major platforms and/or platforms which have a potential for oil and/or sour gas flow (production not shut in) during the design environmental event or in the event of platform failure. Platforms that support major oil pipelines and/or storage facilities are also considered to be in this category.

Level 2 and 3 Platforms. Level 2 and 3 Platforms are either manned but evacuated during the design environmental event (Level 2) or are unmanned (Level 3). Consequences of failure are categorized as either medium (Level 2) or low (Level 3). Level 2 and 3 platforms are typical of the life safety and consequence of failure considerations for the vast majority of the Gulf of Mexico platforms installed to date. All wells on Level 2 or Level 3 platforms that could flow on their own in the event of platform failure must contain fully functional subsurface safety valves. The type of platforms, operations, and the amount and type of equipment on these platforms is specified. Further specifications are being developed to characterize and differentiate the operations and the amount and type of equipment on Level 2 and Level 3 platforms.

Platform Type. Platform type is also an important consideration in selecting appropriate design criteria. Platforms can be classified by their number of legs. Platforms can also be classified by the relative contributions of the environmental loads (waves, currents, and winds).

Platforms with 4 or more Legs and Platforms with fewer than 4 Legs. Platforms with 4 or more legs are inherently more resistant to overall system failure or collapse than platforms with fewer legs. This is due to the additional members typically included in platforms with 4 or more legs which can provide alternate or redundant load paths and thus allow for the redistribution of loads in the event of the failure of one or more

individual structural components. This redundancy generally results in a higher margin between the load at which the platform would collapse and the API RP2A design load. Minimum Structures [reference Section 1.6.5 of Supplement 1 to API RP 2A-WSD, 20th Edition (February 1, 1997)] are included with platforms with fewer than 4 legs.

Wind Dominated Platforms. Most platform designs are typically dominated by the wave and current loads, with wind loads being a secondary factor, which contributes about 10+/- percent of the total environmental load. Design criteria recommended in API RP2A reflect this typical proportion between wave and current loads and wind loads. However a platform with an unusually large deck may have a proportionately larger than typical wind load, and should be considered as a Wind Dominated Platform. Such a platform should utilize different design criteria if the wind load contributes more than 30 percent of the total overturning moment.

Recommended Design Criteria

Platforms with 4 or more legs

Level 1. Level 1 platforms should be designed to the API RP2A 20th Edition design criteria because of the higher life safety and/or consequences of failure. The 20th Edition design criteria is based on the latest theoretical understanding, and should provide suitable design criteria for this most demanding level.

Level 2 or Level 3. Level 2 or Level 3 platforms should be designed to the API RP2A 20th Edition design criteria, or the platform owner may elect to use the API 19th Edition criteria for Level 2 or Level 3 platforms in water depths of less than 400 feet. This reflects the favorable experience over the last 35 years of platforms which were designed to criteria based on the 19th and earlier Editions. The majority of the platforms in this experience base are in water depths less than 400 feet. The platform owner's decision to use the more technically explicit API 20th Edition criteria or the experience based 19th Edition could be motivated by the owner's design philosophy.

Platforms with less than 4 legs (and "Minimum Platforms")

Level 1. Level 1 platforms with fewer than 4 legs should be designed to the 20th Edition with restrictions regarding the use of directional design criteria. API 20th Edition specifies design wave heights by direction (Section 2.3.4c) which can be used to develop design load criteria which vary by direction. We are confident in platform designs developed using such directional loads for platforms with four or more legs, but we are still studying the effect of directional design loads on platforms with less than 4 legs, e.g. tripods and braced caissons. Until we conclude our studies and final recommendations, we recommend that platforms with less than 4 legs be designed with a design criteria equal to the maximum from any direction and that this maximum criteria be applied from all directions

(omnidirectionally). Thus, all factors in Figure 2.3.4-4 of API 20th Edition should be taken as 1.0.

Level 2 and Level 3. Level 2 or Level 3 platforms should be designed to the API 20th Edition design criteria with the same restrictions regarding the use of directional design criteria described immediately above, or the platform owner may elect to use the API 19th Edition criteria (which is also omnidirectional) for Level 2 or Level 3 platforms in water depths of less than 400 feet. As stated above, this reflects the favorable experience over the last 35 years of platforms which were designed to design criteria based on the 19th and earlier Editions. The majority of the platforms in this experience base are in water depths less than 400 feet. The platform owner's decision to use the more technically explicit API 20th Edition criteria or the experienced based 19th Edition could be motivated by the owner's design philosophy.

Wind Dominated Platforms.

Level 1, Level 2, and Level 3. The wind design load criteria specified in API RP2A specifies that sustained wind velocities should be used to compute global wind loads. The sustained wind velocity is taken to be the 1-hour average velocity. The use of the 1-minute average wind velocity is recommended for wind dominated platforms (wind overturning moment greater than 30 percent of total wind, wave, and current loads) for the direction being considered. The determination of whether the wind contribution exceeds 30 percent should be based on the 1-hour average velocity.

The above criteria are summarized in the attached Table 1.

Closure. The Consequence Based Criteria Task Group is continuing its work to distinguish between Level 2 and Level 3 platforms characteristics and develop different design criteria for Level 3 platforms. Until that work is completed, we believe that the design criteria recommendations presented above will serve the needs of the MMS and the offshore industry better than the current regulations. Please contact the undersigned with any questions or if you would like to discuss these recommendations further.

Very truly yours,

[original signed by] Paul Versowsky
 Chairman, API Subcommittee Two (SC2)
 Chevron Petroleum Technology
 Room 1304
 935 Gravier
 New Orleans, LA 70112

Attachment

Ce's (with attachment)

API Subcommittee Two Members (SC2)

API RP 2A Task Group on Consequence Based Design Criteria for New Platforms Members

Michael Craig, UNOCAL

Felix Dhyrkopp, MMS

Rudy Hall, Keystone Engineering

Ward Turner, Exxon

Griff Lee, McDermott

Damo Nair, Mobil

Dirceu R. Botelho, Chevron

E.G. Ward, Shell (Chairman)

Offshore Operators Committee

Table 1. Recommended Interim Design Criteria for New Platforms in the Gulf of Mexico

PLATFORM TYPE	EXPOSURE CATAGORIES	
	LEVEL 1	LEVEL 2 & LEVEL 3
4 or more legs	API RP 2A 20 th Edition	API RP 2A 20 th Edition -or- API RP 2A 19 th Edition if water depth less than 400 feet (owner's prerogative)
less than 4 legs and "Minimum Platforms" as defined in Section 1.6.5 of API RP 2A 20 th Edition, Supplement 1	API RP 2A 20 th Edition modified to produce an omnidirectional design load criterion equal to that of the peak direction. That is, take the maximum load criteria from any direction and use that load criteria for all directions (use Fig. 2.3.4-4 with all factors =1.0).	API RP 2A 20 th Edition modified to produce an omnidirectional design load criterion equal to that of the peak direction. That is, take the maximum load criteria from any direction and use that load criteria for all directions (use Fig. 2.3.4-4 with all factors =1.0). -or- API RP 2A 19 th Edition if water depth less than 400 feet (owner's prerogative)
Wind-dominated design	API RP 2A 20 th Edition modified to compute the wind design load criteria using the 1-minute wind speed in place of the 1-hour wind speed	Choose either API RP 2A 19 th Ed. or API RP 2A 20 th Ed. as above; <u>both</u> must be modified to compute the wind design load criteria using the 1-minute wind speed in place of the 1-hour wind speed