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Booking Proved Reserves Beyond Original Facility Design Life - Gulf of Mexico

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Presentation Overview

- What is Platform Continued Service (PCS)?
- Chevron's Efforts to date for Platform Continuous Service Extensions - background information
- Factors affecting Service Extensions
  - Commitment to extend service life
  - Regulatory requirements
  - Cost estimation
  - Proved Reserves booking - Entitlement and Economic Producibility
- Overall Assurance Requirements for Booking Proved Reserves

Acknowledgements

- Collaborative effort by GOM Business Unit, Global Reserves Group and Ryder Scott Company to develop the background and required documentation for booking Proved Reserves for assets with a Platform Continued Service (PCS) Extension in the Gulf of Mexico (GOM)

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  - Global Reserves Group

  - Ryder Scott Petroleum Consultants
    - Miles Palke & Dan Olds

What is Platform Continued Service (PCS)?

- Offshore structures are certified with a stated “design life” (sometimes referred to as “name plate design life”) based on engineering design and industry safety factors.

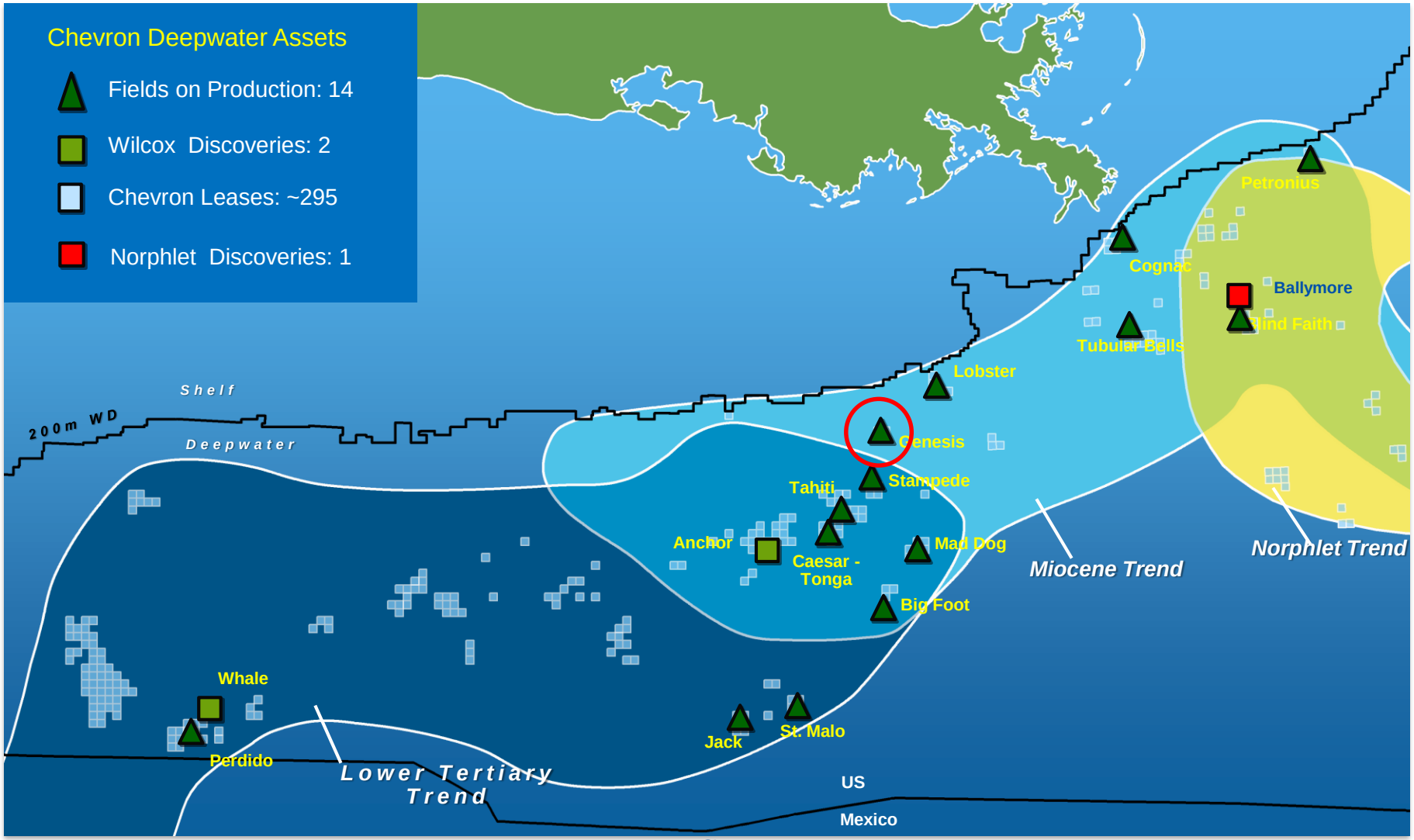
- The design life date does not mandate the abandonment or end of useful life of a structure.

- However, it is a point at which a supplemental assessment must be conducted to verify the condition of the structure and associated components (hull, risers, tendons, etc.,).

- The process of requalifying a structure for continued service is referred to in Chevron as “Platform Continued Service” (PCS).

Blind Faith

Chevron GOM Field Locator Map



GOM Permanent Platforms > 1000’ water depth

(BOEM 2018 data)

Oldest CVX structures

Field	Company Name	Area Code	Block Number	Structure Name	Struc Type	Water Depth (ft)	Install Date	Current Age
MC194	EnVen Energy Ventures, LLC	MC	194	Cognac	FIXED	1023	1/1/1978	40.7
MC281	Exxon Mobil Corporation	MC	280	Lena CT	CT	1000	1/1/1983	35.7
GC065	Fieldwood Energy Offshore LLC	GC	65	Bullwinkle	FIXED	1353	1/1/1988	30.7
GC184	MC Offshore Petroleum, LLC	GC	184	Jolliet TLP	TLP	1760	1/1/1989	29.7
MC109	Stone Energy Corporation	MC	109	Amberjack	FIXED	1100	1/1/1991	27.7
GB426	Shell Offshore Inc.	GB	426	Auger TLP	TLP	2860	2/5/1994	24.6
VK989	Stone Energy Corporation	VK	989	Pompano	FIXED	1290	8/19/1994	24.0
MC807	Shell Offshore Inc.	MC	807	Mars TLP	TLP	2933	7/18/1996	22.1
	Fieldwood Energy LLC	VK	826	Neptune Spar	SPAR	1930	11/19/1996	21.8
	Stone Energy Corporation	VK	956	Ram Powell	TLP	3216	5/21/1997	21.3
GB260	Hess Corporation	GB	260	Baldpate	CT	1648	5/31/1998	20.2
GC205	Chevron U.S.A. Inc.	GC	205	Genesis Spar	SPAR	2590	7/21/1998	20.1
EW921	Eni US Operating Co. Inc.	EW	921	Morpeth East	MTLP	1700	8/10/1998	20.0
MC854	Shell Offshore Inc.	MC	809	Ursa TLP	TLP	3970	12/28/1998	19.7
VK915	Anadarko Petroleum Corporation	VK	915	Marlin TLP	TLP	3236	7/27/1999	19.1
GC254	Eni US Operating Co. Inc.	GC	254	Allegheny Sea	MTLP	3294	8/19/1999	19.0
VK823	W & T Energy VI, LLC	VK	823	Virgo	FIXED	1130	9/17/1999	18.9
AC025	Exxon Mobil Corporation	AC	25	Hoover Spar	SPAR	4825	4/25/2000	18.3
VK786	Chevron U.S.A. Inc.	VK	786	Petronius CT	CT	1754	4/28/2000	18.3
GC158	EnVen Energy Ventures, LLC	GC	158	Brutus TLP	TLP	2900	6/20/2001	17.2
EW958	EnVen Energy Ventures, LLC	EW	1003	Prince TLP	TLP	1500	7/18/2001	17.1
EB602	Anadarko Petroleum Corporation	EB	602	Nansen Spar	SPAR	3675	11/10/2001	16.8
EB643	Anadarko Petroleum Corporation	EB	643	Boomvang Spar	SPAR	3650	4/28/2002	16.3
MC084	Anadarko Petroleum Corporation	MC	127	Horn Mountain	SPAR	5400	6/29/2002	16.2

OTC-27857, Neptune Spar Life Extension Assessments, 2017, Noble Energy & ABS Group

Life Extension for Offshore Floating Assets, Part 1 Safely & Effectively Getting the Most Out of Facilities, 2018, Endeavor Management.com

GC 205 - Genesis Overview

- Classic Spar installed 1998 (2nd in GOM)
- 2600’ water depth
- 14 leg taut mooring system
- 20 year design life
- No major platform or operational changes over life
- Continued Service Assessment
  - Validate fitness for service
  - Obtain regulatory approval to operate for another 10 years

Genesis

Regulatory Interface: Genesis Continued Service Project
2016-2017 timeline

First Deepwater Continued Service Plan (CSP) to be submitted by Chevron to the USCG/BSEE

- ✓ No precedent or formal regulatory policy / industry guidance
- ✓ Work performed in 2016-2017
- ✓ USCG endorsed In-Service Inspection Plan (ISIP) through 2028

Began with high level Regulatory engagement and alignment meeting

- ✓ Initial submittal after completion of CSP
- ✓ Independent third party review of the CSP by a Certified Verification Agent (CVA)
- ✓ Resubmittal with feedback from CVA incorporated
- ✓ USCG approved CSP and associated revised ISIP through 2028

What is Required to Book SEC-Compliant Reserves beyond the Original Design Life?

SEC-compliant oil and gas reserves are required to meet a number of conditions, chief of which is Reasonable Certainty.

- ✓ There must be Reasonable Certainty that volumes will be recovered
- ✓ Both Technical and Commercial Certainty criteria must be addressed
- ✓ Are there sufficient volumes to be produced beyond the original design life?
- ✓ Are the operator and co-owners legally entitled to the produced volumes?
- ✓ Are the volumes economically producible to qualify as reserves?

Tahiti

Factors affecting Booking Reserves for Platform Continued Service Extensions – Entitlement & Commintment

- ✓ Operator and co-owners must be legally entitled to the produced volumes – typically not an issue in GOM.
- ✓ Entitlement depends on whether the relevant contracts, regulations, and regulators will provide the required permissions to continue to a) own and control, and b) operate and produce the field.
- ✓ Documentation that establishes entitlement may include regulations and/or contracts conveying the right to exploit the mineral rights and the right to operate a stationary facility within the regulated waterways.
- ✓ In the case that there appears to be discretion on the part of the regulator as to whether operations will be allowed to continue for the owners, the documentation should be extended to include an analysis of:
  - The track record of the regulator in granting such extensions.
  - The track record of the operator in securing such extensions.
- ✓ Commitment from management and partners to make the required investments and expenditures is required.

Factors affecting Booking Reserves for Platform Continued Service Extensions – Economic Producibility

- ✓ The volumes must be economically producible to be considered reserves.
  - ✓ This must include all the direct costs required to recover those volumes.
  - ✓ Abandonment can be ignored in this determination for developed reserves, but not for undeveloped reserves.
    - ➢ They generate greater revenue than the cost to operate when considering operating costs and investments.
      - ➢ Excludes retirement obligations for assets that have already been developed.
- ✓ Estimated operating costs for offshore facilities should include sufficient expense for maintenance to continue operations in a fashion that is safe and compliant with regulations until the end of the specified design life.
- ✓ Can the facilities as built and maintained to date be safely operated beyond the original design life with reasonable certainty with no additional major investment or any additional operating costs?

Factors affecting Booking Reserves for Platform Continued Service Extensions – Economic Producibility

- ✓ If future investments will be required to mitigate risks to operability or safety, or if additional operating costs will likely be incurred these costs must be estimated and included in the economic producibility calculations.

- ✓ Engineering studies must be detailed enough to identify specific expenditures that will result in these expenses.

- ✓ Along with cost estimates and lists of activities, a schedule of those activities should be developed.

- ✓ **The reserves associated with production beyond the specified design life must be economically producible when all of the anticipated, additional investments and operating costs are considered.**

Support for booking Proved Reserves Beyond Platform Design Life

- High confidence level for future regulatory approval
  - ✓Based on work performed at Genesis
  - ✓Numerous conversations with BSEE and USCG staff

- Minimal mechanical/structural risk perceived by Facility Engineering team
  - ✓Condition of platform and associated equipment is deemed good
  - ✓Ongoing thorough asset integrity inspection/monitoring program in place
    - Both Chevron (internal) and Regulatory (external)

- Production profiles pass the Economic Limit and/or Economic Producibility test
- Cost estimates being used generally P50 (mid-case) or best technical estimate
- Alignment with operator's plans or co-owners aligned with Chevrons' plans
- Costs are included in business plan

Other Potential Issues

Different components of field infrastructure have different specified design lives.

- Flow lines could feature a shorter life expectancy than topsides.
- Either the earliest date of expiry should be adopted for all production, or
- Future recoverable volumes should be estimated with the assumption that production through those systems that have the shorter life expectancy ends production for those systems earlier.

Other Potential Issues

- Facilities with significant known issues that call into question their integrity.
- Situation arising from unexpected development such as:
    - Development of sour gas at concentrations beyond design specification,
    - Subsidence,
    - Loss of station keeping for floating vessels, or storm damage.
- Additional analysis, work and commitment to proceed with remediation should be conducted before volumes could be considered reserves.
- More detailed remediation planning would be called for, along with more detailed engineering.
- Additional evidence of managerial, partner, and government approval and commitment to proceed with mitigation activities should be provided.

Required Documentation for Proved Reserves Bookings

Should include (but not be limited to) the following items:

- Historical inspection records and comments from regulatory agency related to recommended PCS action items
- Historical track record of approvals by the regulatory agency related to any certification, (e.g. Certificate of Inspection (COI), Renewal of Certificate, etc.)
- Anticipated future inspection timeline (Chevron internal and regulatory agency inspections)
- Cost estimates associated with future PCS periods (and source of estimates – CVX, NOJV operator, 3rd Party)
- Confirmation that Chevron Facilities Engineering (FE) group is aligned with PCS plans, cost estimates and time frame for either a COOP or NOJV asset
- Historical and forecast maintenance capital (and/or Opex) - actual spend data
- Business commitment to make required investments and expenditures (Operator and necessary co-owners)
- Economic Limit and Economic Producibility test documentation for all Proved booked volumes using SEC price deck and PCS cost assumptions
- Annual update of PCS template in an Asset Development Plan (ADP)

Booking Reserves for Platform Continued Service Beyond Original Design Life

Key Messages

Platform Continued Service (PCS) extension

- To date, Chevron has only one platform in Deepwater GOM (Genesis) that has reached the first “name plate” design life date. The continued service review process was completed in 2017 for this asset.
- Collaborative effort in 2018 by GOM Business Unit, Global Reserves Group and Ryder Scott to develop background and documentation for PCS bookings in three other Deepwater GOM assets.

Factors affecting Platform Continued Service extensions – Technical & Business Certainty for booking reserves – Establishing Reasonable Certainty

- Support by Operator and co-owners in pursuing service extensions
- Regulatory requirements for agencies involved in permitting an extension
- Cost estimates associated with platform service extension work obtained and/or verified through Chevron Facilities Group & 3rd Party entities
- Entitlement and Economic Producibility established
- Documentation associated with these Proved Reserves bookings maintained by asset teams and updated as required

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Questions?

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