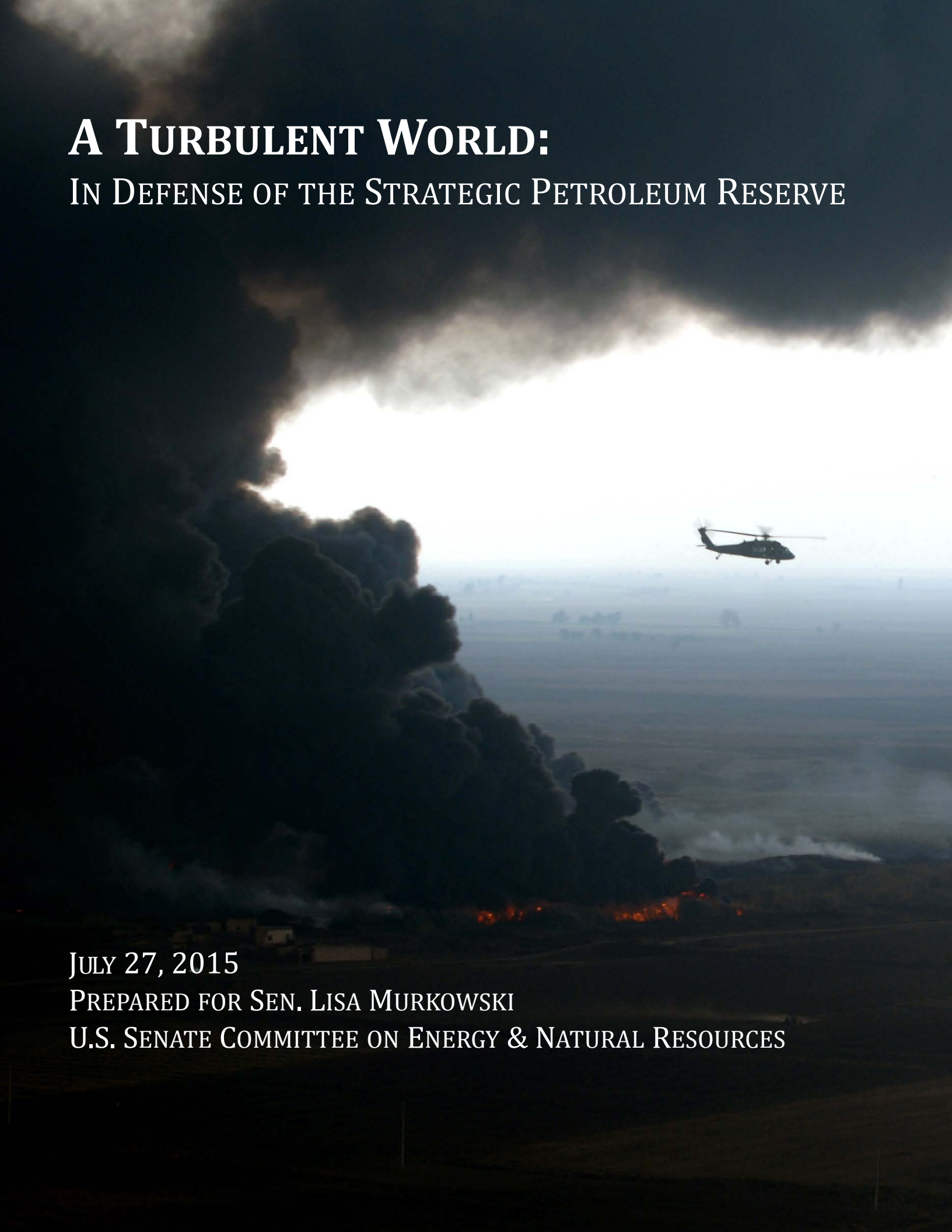
A Turbulent World:

In Defense of the Strategic Petroleum Reserve



July 27, 2015

Prepared for Sen. Lisa Murkowski

U.S. Senate Committee on Energy & Natural Resources

A Turbulent World:
In Defense of the Strategic Petroleum Reserve

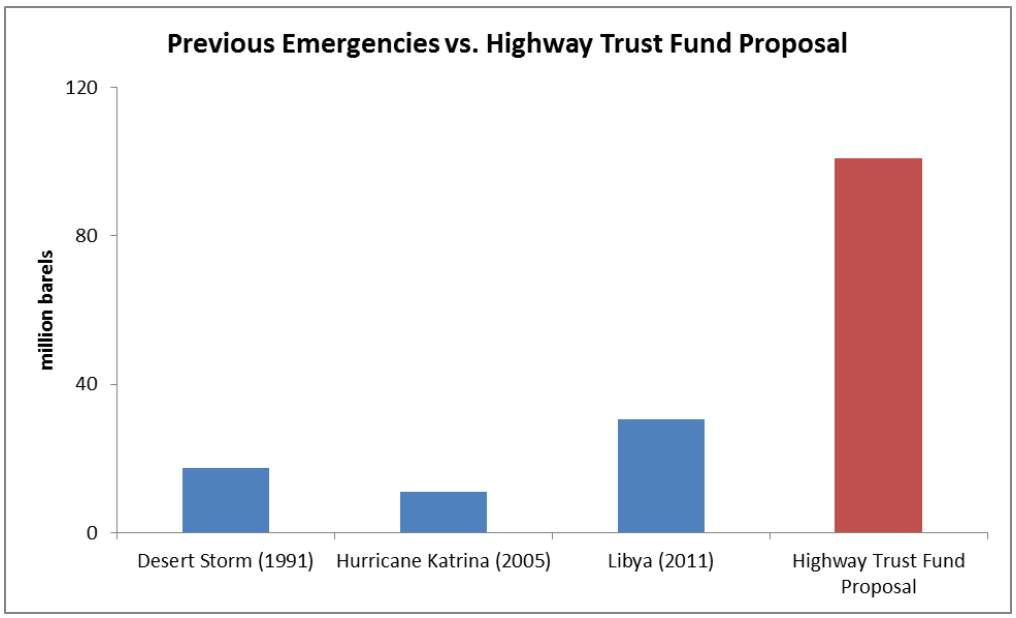
Prepared by Majority Staff for Chairman Lisa Murkowski
U.S. Senate Committee on Energy & Natural Resources
July 27, 2015

Introduction

The Strategic Petroleum Reserve (SPR) was originally authorized by the Energy Policy and Conservation Act of 1975. Today, the Senate is deliberating over the Developing a Reliable and Innovative Vision for the Economy (DRIVE) Act, known colloquially as the reauthorization of the Highway Trust Fund. Such a reauthorization, however, costs billions of dollars per year. The DRIVE Act presently includes a provision that authorizes the drawdown and sale of 101 million barrels of crude oil from the SPR during the 2018-2025 period as partial payment for a three-year reauthorization of the Highway Trust Fund. This report argues against such a sale, which would be unprecedented in scope and would occur at a time of elevated threats to global oil production and distribution.

Scope

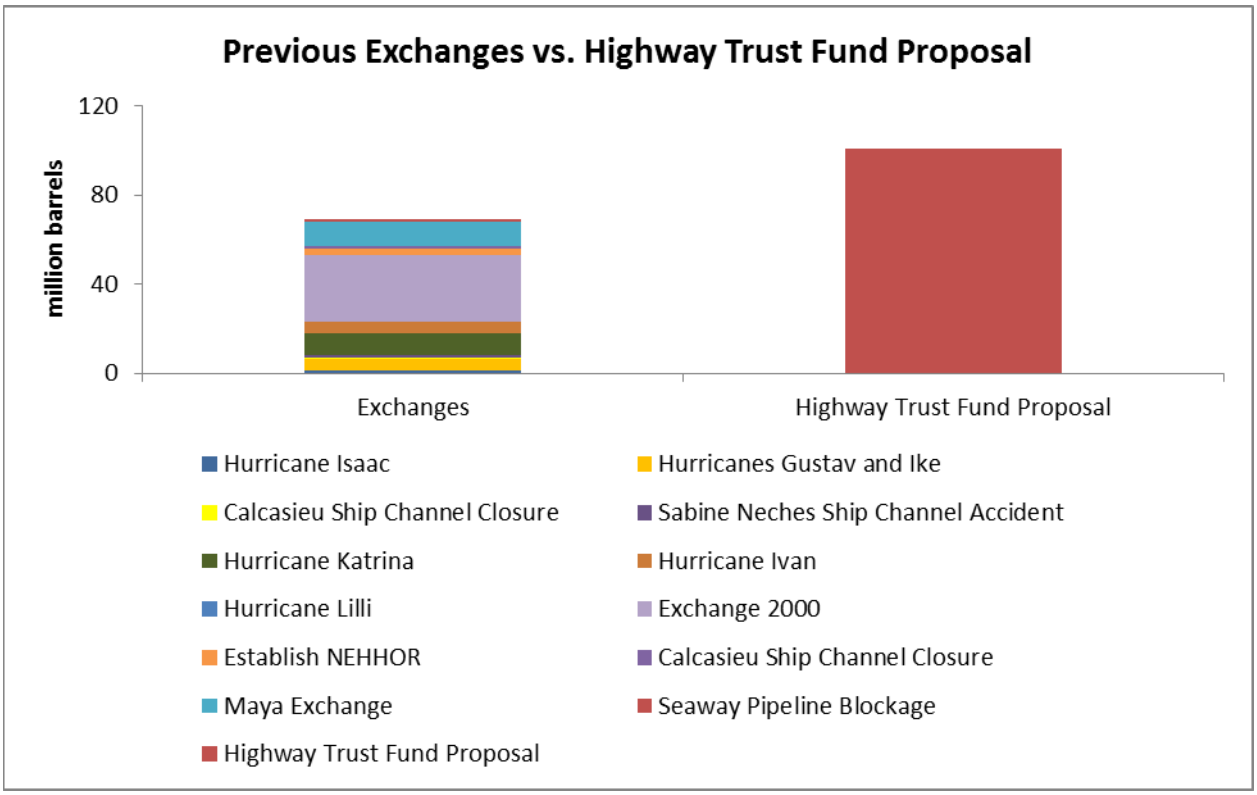
The President has only authorized three emergency drawdowns of the SPR. The first occurred in 1991 during Operation Desert Storm. The second occurred in 2005 in response to Hurricane Katrina. The third occurred in 2011 during the Libyan civil war. The combined total of all three drawdowns was 58.9 million barrels.[1]



Source: CRS

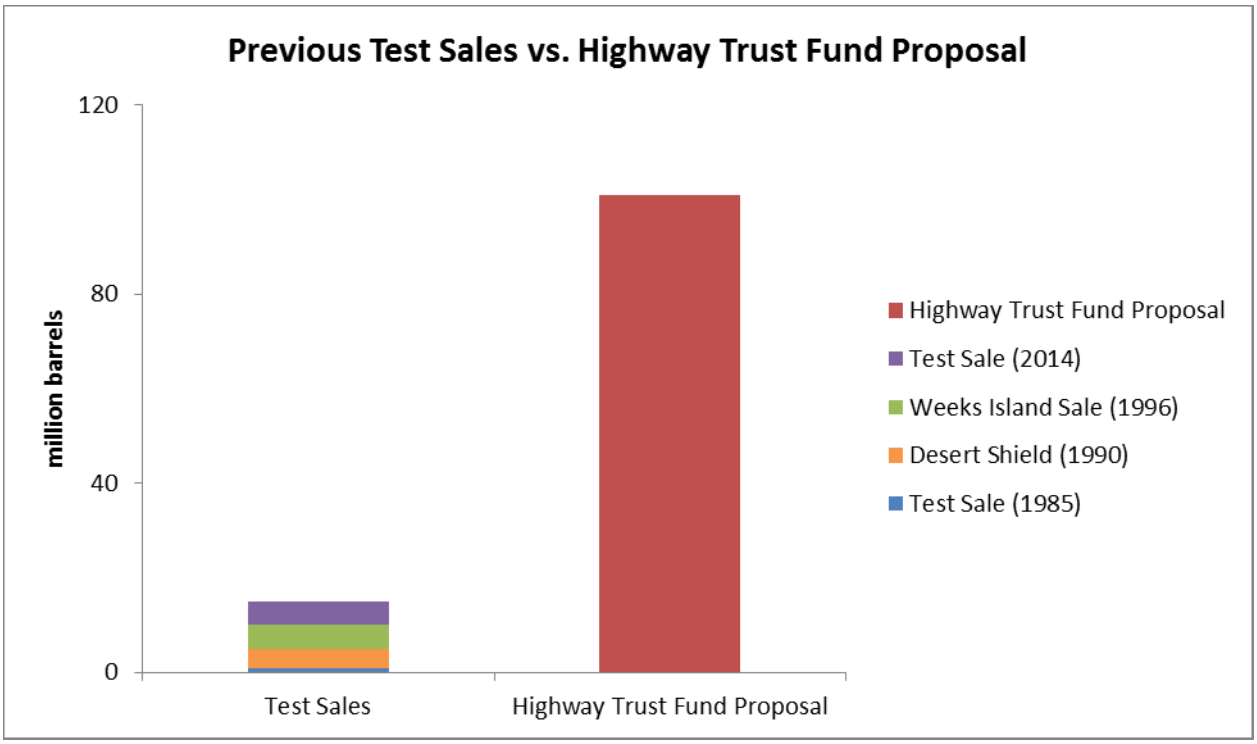
[1] Historical drawdown statistics are drawn from Congressional Research Service, *The Strategic Petroleum Reserve: Authorization, Operation, and Drawdown Policy* (August 27, 2013).

In addition to the presidentially-directed drawdowns, there have also been 12 exchanges of SPR crude oil for a variety of reasons. These have included the creation of new product reserves, as well as responses to natural disasters and other accidents. The combined total of all these exchanges was 68.9 million barrels.



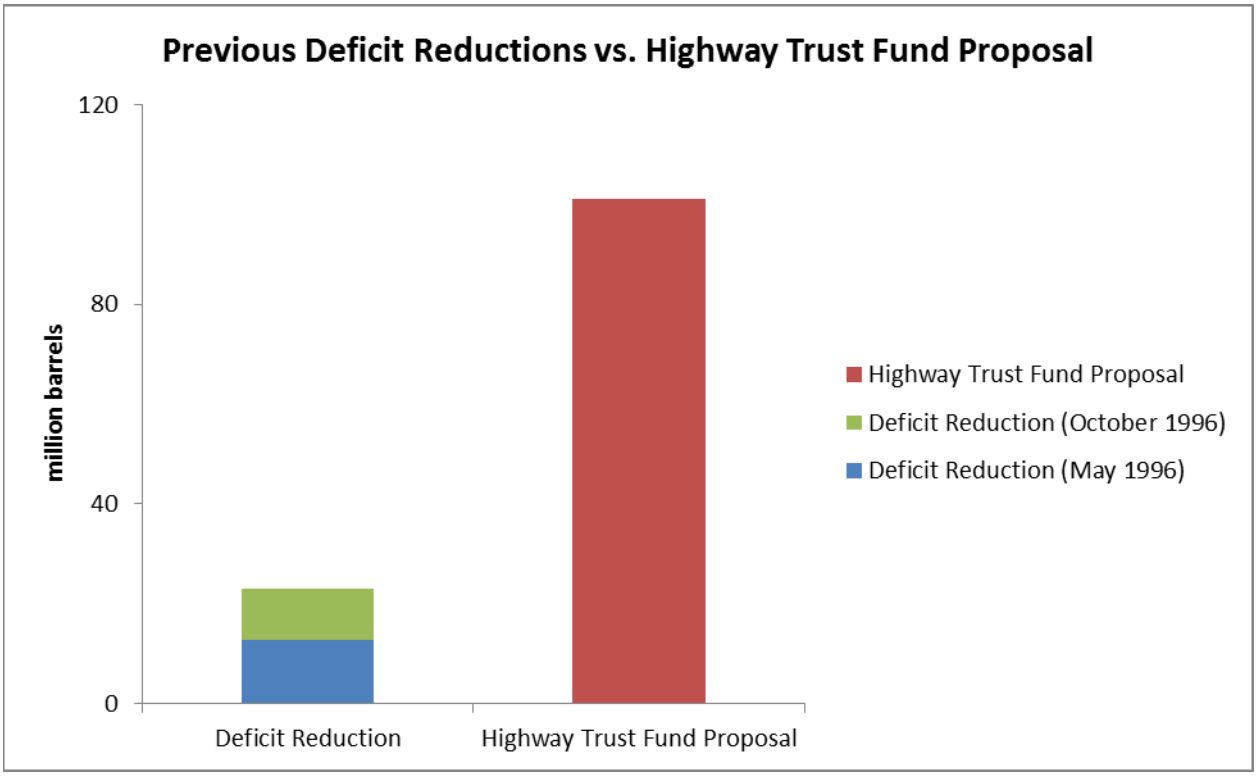
Source: CRS

Besides presidentially-directed drawdowns and exchanges, SPR crude oil may also be sold as part of "test sales." Purposes include demonstrating readiness, checking for maintenance requirements and assessing infrastructure needs. Three such sales have occurred for a total of 9.9 million barrels. (See Appendix A.) In addition, DOE conducted a 5.1 million barrel sale to decommission the Weeks Island facility in 1996.



Source: CRS

Finally, on two occasions in 1996, SPR drawdowns were mandated for deficit reduction purposes by Congress. The total of both drawdowns combined was 23 million barrels.



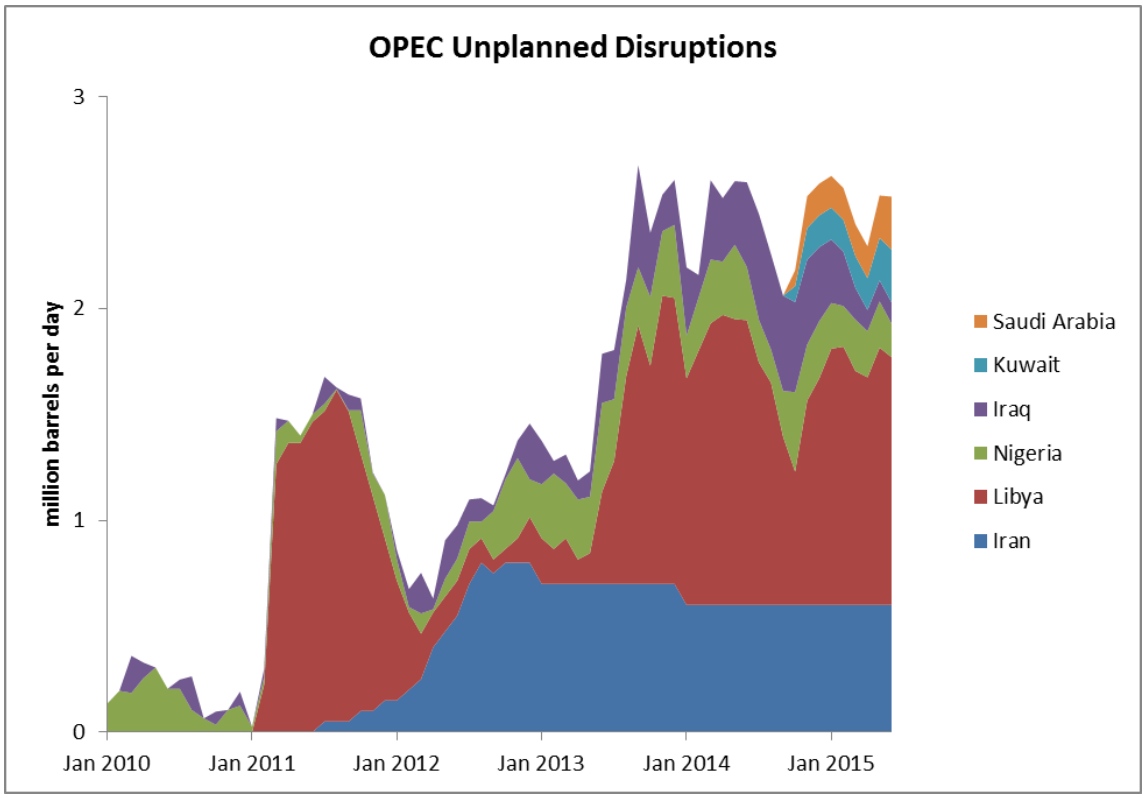
Source: CRS

In short, the federal government has drawn down the Strategic Petroleum Reserve numerous times over the past three decades for a total of 166 million barrels. A sale of 101 million barrels would be unprecedented in both its duration and volume.

Threats to Global Oil Production and Distribution

The United States is virtually unique among all members of the International Energy Agency in fulfilling its emergency stockpile requirement through government-controlled reserves. (See Appendix B.) The maximum notional drawdown rate of SPR is approximately 4.4 million barrels per day. The SPR would be able to put more barrels onto the global market more quickly than any other nation's emergency stockpiling system.

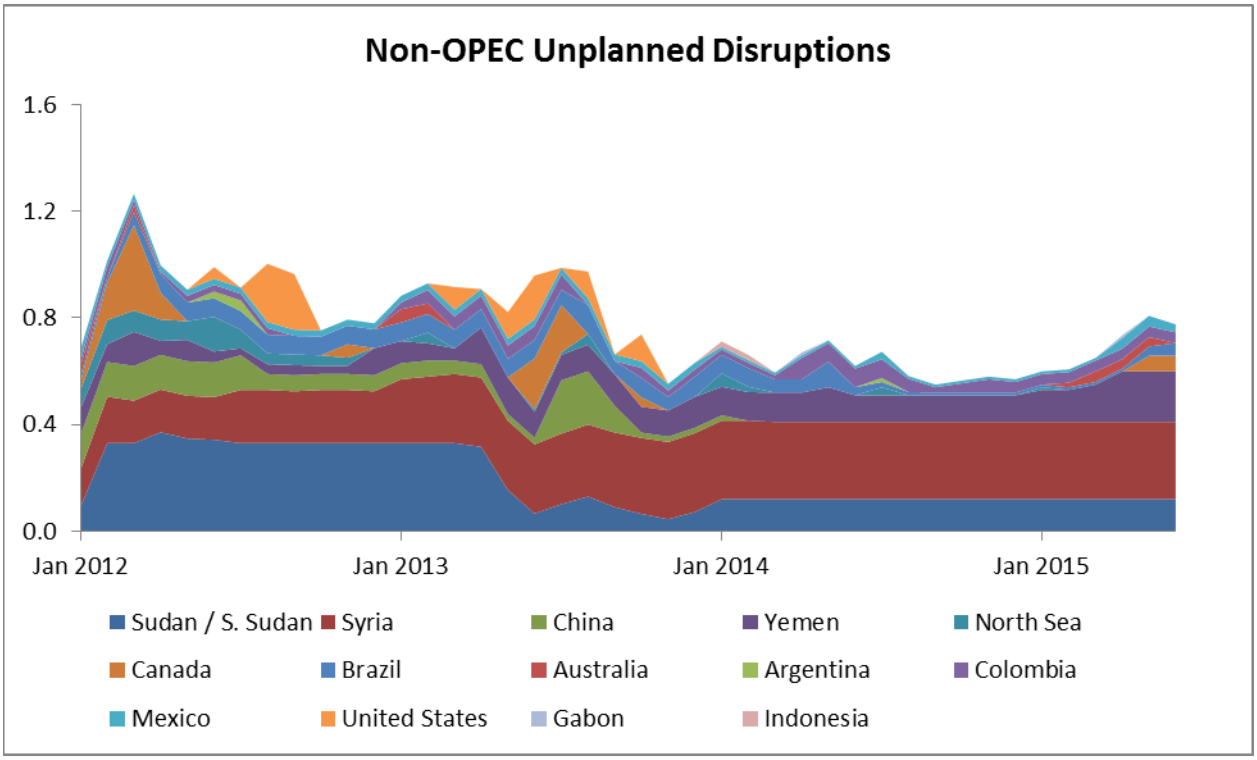
The proposal to sell SPR oil comes at a time of heightened unplanned petroleum production outages across the world. For example, violence rages in Libya, Nigeria, and Iraq, and tensions are high between Iran and the Gulf Arab states, including Saudi Arabia. Unplanned outages in the Organization for Petroleum Exporting Countries (OPEC) remain at elevated levels near 3 million barrels per day.[2]



Source: EIA

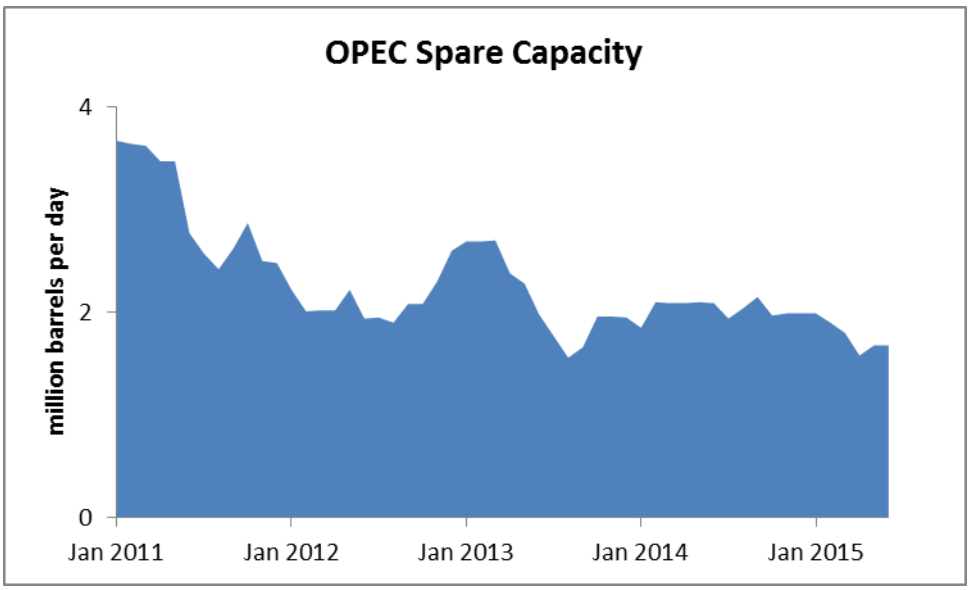
[2] All unplanned disruption and OPEC spare capacity statistics are drawn from EIA, *Short-Term Energy Outlook* (July 7, 2015): http://www.eia.gov/forecasts/steo/pdf/steo_full.pdf.

In addition to the outages among OPEC countries, many countries that are not members of OPEC are also experiencing unplanned supply disruptions. These include Yemen and Syria, for example, which are engulfed in civil war. These levels are hovering just under 1 million barrels per day.



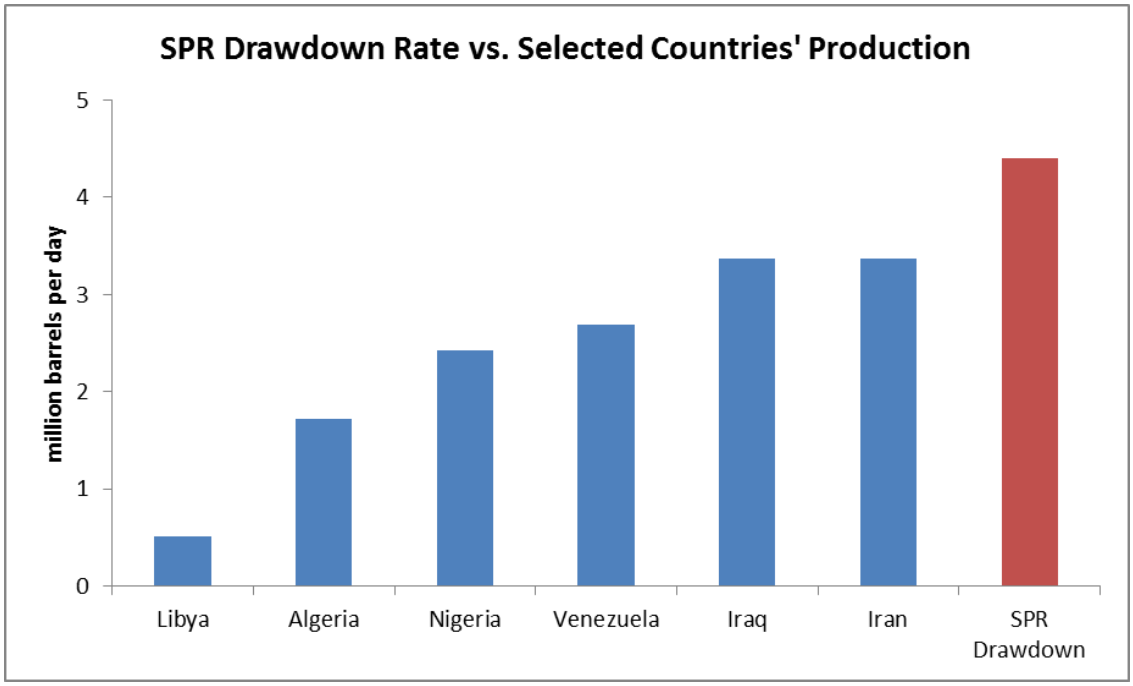
Source: EIA

A valuable proxy for oil production that could be quickly ramped up in the event of a crisis is OPEC "spare capacity." This has traditionally been the role of Saudi Arabia. The rise of North American oil production, however, has coincided with a decline in this spare capacity, from nearly 4 million barrels per day in 2011 to under 2 million barrels per day today. In other words, during an emergency the global oil market will have less ability to boost production in a timely fashion.



Source: EIA

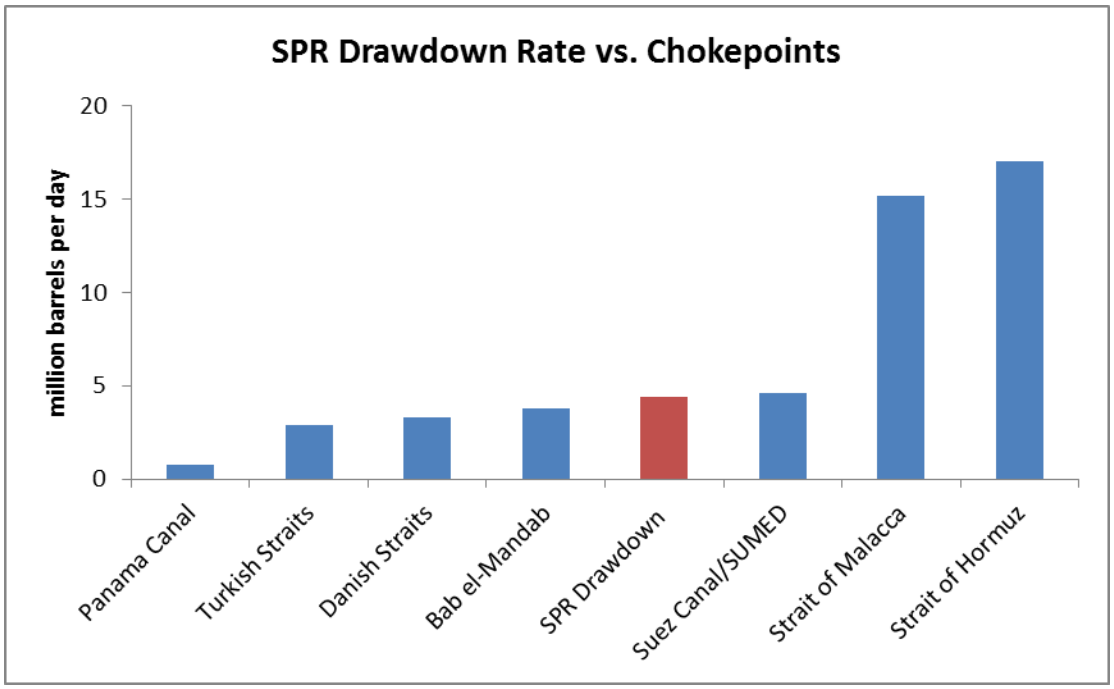
Another measure of assessing the SPR drawdown rate is to compare it to the daily production of selected countries. A capacity of 4.4 million barrels per day is higher than the production levels of several key nations, such as Iran, Iraq, Venezuela, Nigeria, Algeria, and Libya. The Strategic Petroleum Reserve would be a key asset for U.S. national security in the event that geopolitical tensions in and among any of these nations reached a crisis point.[3]



Source: EIA

[3] Production statistics are drawn from EIA, International Energy Statistics (2014): http://www.eia.gov/beta/international/.

Finally, the SPR could be called upon in the event that the world's oil transit chokepoints became threatened. A capacity of 4.4 million barrels per day is comparable to the amount of oil that flows past Yemen, for example, or through Egypt. It would be insufficient to replace barrels that were blocked in the Straits of Malacca or Hormuz, which are the world's two most important transit routes for petroleum, but American barrels would increase in their value immeasurably in such a scenario regardless.[4]



Source: EIA

Conclusion

The Strategic Petroleum Reserve is a vital asset in the arsenal of tools with which the United States may respond to global crises. A sale of 101 million barrels of crude oil from this reserve for purposes unrelated to energy security would be unprecedented in the volume of barrels flowing out of the SPR and would occur at a particularly dangerous time for international security.

Acknowledgments

Staff wish to thank the Congressional Research Service for its assistance with this report. The cover image is of a U.S. Army helicopter assessing an oil pipeline fire in Iraq.[5]

[4] Chokepoint statistics are drawn from EIA, *World Oil Transit Chokepoints* (November 10, 2014): http://www.eia.gov/beta/international/analysis_includes/special_topics/World_Oil_Transit_Chokepoints/wotc.pdf.

[5] Timothy Kingston (December 27, 2005): http://www.defense.gov/photos/newsphoto.aspx?newsphotoid=7489.

APPENDIX A:
CRS Memo Re: 2014 Test Sale

Congressional Research Service
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MEMORANDUM

To: Senate Energy and Natural Resources Committee
Attention: Tristan Abbey

From: Anthony Andrews, Specialist in Energy Policy

Subject: **Strategic Petroleum Reserve Test Sale 2014**

This memorandum answers your request for a summary of the 2014 Strategic Petroleum Test Sale. The Secretary of Energy authorized the test sale for up to 5 million barrels of crude oil from the Big Hill and West Hackberry Strategic Petroleum Reserve (SPR) sites. The two sites are part of the TEXOMA distribution system. DOE's Office of Petroleum Reserves conducted the test sale between March 2014 and July 2014 to evaluate the ability to sell, drawdown and distribute crude oil in accordance with requirements of Energy Policy and Conservation Act (EPCA) Section 161(g) and the competitive sales process in 10 C.F.R. 625. DOE justified the test sale based on significant changes in domestic crude oil production, increased imports of Canadian crude oil, and changes to crude oil distribution infrastructure upon which the SPR relies. The SPR Test Sale delivered 4,998,146 barrels of crude oil over a 47-day period that netted $468,564,599 in cash receipts to the U.S. Government. The entire timeline, from planning to collecting receipts, however, was closer to 7 months.

Legislative Authority

The Energy Policy and Conservation Act (EPCA) as codified in 42 U.S.C. 6241(g) directs the Secretary of Energy to "conduct a continuing evaluation of the drawdown and sales procedures. In the conduct of an evaluation, the Secretary is authorized to carry out a test drawdown and sale or exchange of petroleum products from the Reserve. Such a test drawdown and sale or exchange may not exceed 5,000,000 barrels of petroleum products."

Furthermore, the product cannot be sold " at a price less than 95 percent of the sales price . . . of comparable crude oil being sold in the same area at the time . . . ," and "to the extent that funds are available in the SPR Petroleum Account as a result of such sale, acquire petroleum products for the reserve within the 12-month period beginning after completion of the sale."

Test Sale Timeline

DOE reports that it conducted the test sale to exercise both the sales procedures and the drawdown process.[1] In summary, the test sale proceeded along the following time line:

- January 6, 2014−DOE Secretary and Fossil Energy Office begin internal to discussions to plan test sale.
- March 12, 2014−Notice of Sale issued offering 5 million barrels of light sour crude oil from the Big Hill and West Hackberry SPR sites in the SPR TEXOMA (Texas-Oklahoma) distribution system.
- March 14, 2014−37 bids received from 12 companies requesting a total of 18.5 million barrels of crude oil.
- March 17, 2014−Five companies announced as successful bidders, which were subsequently awarded contracts for 5 million barrels.
- March 31, 2014−Crude oil deliveries initiated.
- May 2, 2014−DOE Secretary announces creation of Northeast gasoline refined product reserve.
- May 16, 2014− Deliveries completed in 41 separate shipments; 4.62 million barrels (92.4%) by pipeline, and 380,000 barrels (7.6%) via tank barge to Gulf Coast refiners located in Texas and Louisiana.
- July 3, 2014−Financial transactions completed; $456.6 million deposited into the U.S. Treasury.

The test sale concluded with no personnel accidents or environmental incidents. All pipeline and marine deliveries were to Gulf Coast refiners located in Texas and Louisiana.

Table 1. Summary of Test Sale Contracts, Volumes, and Prices

Company	Number of Contracts	Contract Volume Bbls	Bid Price $	Total Bid $	Delivered Volume Bbls
Mercuria	1	40,000	$95.40	$3,816,152	40,118
Phillips 66	6	2,040,000	$100.23	$204,470,080	2,040,024
Marathon	5	1,200,000	$99.06	$118,876,500	1,200,024
Shell	3	1,220,000	$97.53	$118,981,040	1,217,075
ExxonMobil	2	500,000	$97.68	$48,838,475	500,905
Total	17	5,000,000	$99.00	$494,982,247	4,998,146

Source: DOE SPR Test Sale 2014 Report to Congress

Notes: Bid Prices are weighted averages. Mercuria is an energy and commodity-trading firm.

[1] DOE, Strategic Petroleum Reserve Test Sale 2014, Report to Congress November 2014.

Lessons Learned

DOE concluded that the test sale was successful exercise in demonstrating both the sales procedures and the drawdown process, but there were operational and procedural lessons that DOE learned about the TEXOMA Distribution Group:

Drawdown Process:

- Pipeline capacity on the Shell Ho-Ho pipeline is limited due to the large volumes of Eagle Ford crude oil shipped from Texas to Louisiana.
- Crude oil terminal storage-capacity at the Sun Nederland terminal is limited which could affect SPR distribution capability for purchasers without access to storage capacity at this terminal.
- Marine terminal distribution capacity is limited, and could pose a challenge to the SPR's marine distribution capability in the SPR TEXOMA Distribution Group for a drawdown of significant scope:
  - the minimum delivery quantity for barge delivery was reduced from 50,000 barrels to 40,000 barrels to encourage smaller coastal U.S.-flag barges
  - the minimum delivery quantity for tankers was reduced from 330,000 barrels to 290,000 barrels to encourage U.S.-flag ships
  - during the test sale, the Unocal marine terminal was up for sale and did not participate
  - new pipeline construction into Port Arthur, TX, is significantly increasing crude oil volume moved to storage terminals and is causing increased dock utilization rates and potentially impacting dock availability in the event of a future SPR drawdown
  - the Sun Nederland terminal, important to SPR marine distribution, plans to convert one of its five existing tank ship docks from crude oil to liquefied petroleum gas (LPG) service.
- Custody transfer flow metering limits drawdown at the SPR Big Hill site.
  - despite multiple delivery points to move SPR crude oil, design of the custody transfer flow metering-skid restricts delivery to a single delivery point at any one time; a 2nd custody transfer flow metering skid would improve distribution flexibility and reliability
  - equipment failure of the custody transfer flow metering-skid for 72-hours could have compromised crude oil delivery, underscoring the need for a second custody transfer flow metering-skid.

Sales Procedure:

- **Insufficient Bidding Time**
  - the 2 business-days period to submit bids was insufficient time for most bidders

- bidders generally require at least 5 business days to formulate their bids and acquire the necessary financial instruments (letters of credit and guarantees) to support their bids.

- **Payment Delays**

- payment method used for the test sale did not lead to quicker payment of invoices
- the Standard Sales Provision (SSP) payment clause stipulating payment due by the 20th of the month following delivery should remain in effect for future drawdowns.

- **Notice of Sale**

- information on shipping terminal, points of contact, and certain technical details was not current (and was updated)
- automated clearing house payment option is no longer acceptable (and was removed)
- information on FEDWIRE payment method was not current (and was updated)
- information on the Jones Act was not current (and was updated).

- **SPR Oil Valuation Model**

- accuracy of valuing the SPR crude oil streams was validated

SPR Office Conclusions

DOE plans a number of actions in response to above learned lessons.

Sun Nederland Terminal − Storage capacity at the terminal is fully subscribed and may possibly affect the ability to distribute SPR crude oil should a purchaser not have access to storage capacity at the terminal during a drawdown. The SPR will discuss this situation with the terminal owner/operator to gain better insight and clarity into this issue.

Availability of U.S-Flag Vessels − Initially, 10.4% of deliveries were scheduled for ocean-going tankers. However, for unknown reasons, the successful offeror was apparently unable to charter a U.S.-flag vessel. After submitting a Jones Act waiver request to DHS for a non-U.S.-flag vessel, the offeror withdrew the request and rescheduled delivery via pipeline.

The SPR office was unable to determine whether larger U.S.-flag vessels were available at the time and is concerned whether their availability could play a factor in the event of a drawdown. The SPR office met with representatives of the U.S. maritime industry to discuss this issue and intends to meet with the U.S. Maritime Administration. The office also intends to reexamine the capabilities of the dock configurations at all contracted marine terminals in order to evaluate the types and sizes of vessels suitable for the docks.

Unocal Terminal − No bidders utilized the Unocal terminal as a delivery point during the test sale. The terminal's pending sale status could have been a factor. Conversely, the smaller daily volume deliverable under the existing SPR contract with the terminal (200,000 barrels/day) could have also been a consideration by bidders. The office intends to clarify this issue, and assess the feasibility of increasing contracted throughput volumes at this terminal.

TEXOMA Pipeline System − Changes in oil markets have implications for commercial infrastructure investment in the region and for the TEXOMA system and the entire SPR. The SPR office proposes to conduct follow-on analyses of potential commercial infrastructure investments and options to ensure future SPR marine distribution capability.

Custody Transfer Flow Metering − Sometimes called a fiscal meter or billing meter, a flow meter is used to determine how much of a commodity changes hands in exchange for some monetary or financial consideration. In order to improve distribution flexibility and reliability from the SPR Big Hill site, the SPR office intends to evaluate the feasibility of an additional custody transfer flow-metering skid.

Other Considerations

While the test sale revealed minor operational and procedural issues, none seemed to compromise the SPR's mission. However, an earlier sale had very much demonstrated the SPR's mission readiness. On June 23, 2011, the International Energy Agency (IEA) announced that its 28 member countries would release 60 million barrels of crude oil and refined products into the global market in response to Libya's curtailment of crude oil production. As part of that action, the President directed a drawdown of the SPR to meet the U.S. response obligations for 30 million barrels, and DOE issued a Notice of Sale and that same day. On June 24, 2011, DOE opened its web-based Crude Oil Sales Offer System for a five-day sale of 30.237 million barrels of light, sweet crude oil at a bid reference price of $112.78 a barrel. DOE received more than 90 offers for SPR crude oil, awarded 28 contracts to sell 30.64 million barrels of crude oil at an average price of $107.21 per barrel. The oil sold came from the Bryan Mound and Big Hill sites in Texas, and the West Hackberry, LA, site.

One factor had changed since the 2011 sale, however. In 2013, DOE awarded the Fluor Federal Petroleum Operations, LLC[2] a management and operating contract valued at $1.46 billion to run the SPR for a period of 5 years, with an option for an additional 5 years based on performance.[3] The change in the management contract would have been sufficient rationale for conducting a test sale as a training and readiness exercise.

Monetary amounts resulting from a drawdown, sale, and delivery of petroleum products from the reserve must be deposited in the SPR Petroleum Account under 42 U.S.C. 6247 – SPR Petroleum Account. The amounts "may be obligated by the Secretary of Energy for the acquisition, transportation, and injection of petroleum products into the Strategic Petroleum Reserve, for test sales of petroleum products from the Reserve, and for the drawdown, sale, and delivery of petroleum products from the Reserve."

As noted above, EPCA (42 U.S.C. 6241) authorizes the Energy Secretary to acquire petroleum products for refilling the reserve within the 12-month period beginning after completion of the sale to the extent that funds are available in the SPR Petroleum Account as a result of such sale. On May 4, 2014, Energy Secretary Moniz stated that the Department would establish a 1 million barrel gasoline reserve for the Northeast to provide some short-term relief in the event of significant disruptions. Locations in New York Harbor and in New England would each store 500,000 barrels of gasoline.

[2] Team includes members comprised of Parent Company Fluor Federal Services, Inc., of Arlington, Virginia and major subcontractors MRIGlobal of Kansas City, Missouri; Booz Allen Hamilton of Mclean, Virginia; and ASRC Petroleum Operations and Maintenance of Anchorage, Alaska.

[3] DOE Awards Management and Operating Contract for DOE's Strategic Petroleum Reserve, http://energy.gov/fe/articles/doe-awards-management-and-operating-contract-doe-s-strategic-petroleum-reserve.

The precedence for establishing the gasoline reserve may have some basis in the Northeast Home Heating Oil Reserve (NHHOR). In response to the 1999-2000 heating oil price spike and supply shortage, Congress authorized the Secretary of Energy to establish NHHOR in the Energy Act of 2000 (P.L. 106-469). As a 2 million barrel emergency stockpile of government owned heating oil, NHHOR was intended to meet roughly 10 days of demand by the Northeastern states at the time it was created. Subsection (e) of P.L. 106–469, §103(19)(B), struck out subsection (e) of section 6247 (SPR Petroleum Account) which previously read:

"(1) Except as provided in paragraph (2), nothing in this part shall be construed to limit the Account from being used to meet expenses relating to interim storage facilities for the storage of petroleum products for the Strategic Petroleum Reserve."

In striking out subsection (e), Congress established NNHOR separate from the SPR acquired "by purchase, exchange (including exchange of petroleum products from the Strategic Petroleum Reserve or received as royalty from Federal lands), lease, or otherwise, petroleum distillate for storage in the Northeast Home Heating Oil Reserve" (46 USC 6250a.).

APPENDIX B:
CRS Memo Re: IEA Stocks

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MEMORANDUM

To: Senate Energy and Natural Resources Committee
Attention: Tristan Abbey

From: Robert Pirog, Specialist in Energy Economics

Subject: **International Energy Agency Stock Requirements**[1]

This memorandum is written in response to your request for an explanation of the institutional structures that can be used to satisfy the International Energy Agency's (IEA) emergency stockholding requirements. In addition, you requested a table that categorized IEA member countries by their chosen stockholding structure. You provided IEA source material to provide content for this memorandum, including Energy Supply Security, 2014, a presentation by Martin Young, the Head of the IEA Emergency Policy Division, and a webpage concerning energy supply structures. A review of this material has revealed inconsistencies among the documents concerning how some countries should be identified with respect to their stockholding structure.

Stockholding Structure

The IEA requires each member country to hold stocks of crude oil and/or petroleum products equivalent to 90 days of net imports for use in emergency situations.[2] A degree of flexibility exists with respect to the choice of institutional structure allowed to fund and/or manage the required stocks. According to the IEA, stocks may be held as industry stocks, government stocks, or agency stocks, or some combination thereof. An additional term used by the IEA is public stocks, which the IEA defines as the sum of government and agency held stocks.

Industry Stocks

Stocks held by industry, irrespective of whether they are held as crude oil or petroleum products, for commercial purposes, or to meet government rules, all count toward the IEA 90-day stock requirement. Typically, firms involved in the oil industry—importers, refiners, and product suppliers—are required to hold various minimum numbers of days of stocks. The IEA reports that 15 out of 29 member countries used industry stocks to meet all, or part, of their IEA stockholding obligations. Seven countries chose to

[1] This memorandum draws heavily on, International Energy Agency, "Energy Supply Security 2014," in all sections.

[2] Net imports are imports minus exports, the nation's net dependence on world oil markets. IEA member countries that are net exporters of oil are exempt from emergency stockholding requirements. These countries include Canada, Denmark and Norway. However, Denmark and Norway have stockholding structures in place. Australia has no stockholding requirements for industry, nor does it hold public stocks.

use industry stocks to meet the totality of their obligation. Nine countries place no requirement on industry to meet IEA requirements.

Government Stocks

Government-owned stocks are financed and managed through the central government and are held strictly for emergency purposes. Six countries hold government stocks.

Agency Stocks

Some IEA member countries have chosen to establish separate agencies through legislation that have the responsibility of holding all, or part, of the countries' emergency stocks. These agencies can be administered by the government, or be industry-owned, or led.

IEA Member Structures

Table 1 categorizes the IEA member countries' stockholding systems. The categorizations in the **Table** have, for some countries, varied over time. For example, Belgium began with an industry-based system which transitioned over several years to an agency-based system. The United States is unique in holding government stocks, all in crude oil, to meet the 90-day net import replacement requirement.

Table 1. IEA Stockholding Structures, 2014

Type of System	Agency	Government	Industry	Agency/Industry	Agency/Gov't
Countries	Belgium, Estonia, Germany, Hungary, Ireland, Slovak Republic	Czech Republic, New Zealand, United States	Greece, Luxembourg, Norway, Sweden, Switzerland, Turkey, United Kingdom	Austria, Denmark, Finland, France, Italy, Netherlands, Portugal, Spain	Japan, Korea, Poland

Source: International Energy Agency, "Energy Supply Security 2014," Table 2.1, p. 32, and Martin Young, "US SPR's International Role", CSIS, May 6, 2015.

Notes: Differences between the Martin Young and Energy Supply Security 2014 tables, notably the positions of Belgium and Switzerland, were resolved for consistency with the Energy Supply Security 2014 table. In addition, Australia and Canada have no stockholding systems. Differences between Energy Supply Security 2014, Table 2.1 and the accompanying text on pages 30-33 were resolved in favor of the usage in Table 2.1 for consistency.