



# The Strategic Petroleum Reserve: History, Perspectives, and Issues

**Robert Bamberger**  
Specialist in Energy Policy

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## Summary

Congress authorized the Strategic Petroleum Reserve (SPR) in the Energy Policy and Conservation Act (EPCA, P.L. 94-163) to help prevent a repetition of the economic dislocation caused by the 1973-1974 Arab oil embargo. The program is managed by the Department of Energy (DOE). The capacity of the SPR is 727 million barrels, and in mid-February 2009, held slightly more than 704 million barrels of crude oil. In addition, a Northeast Heating Oil Reserve (NHOR) holds 2 million barrels of heating oil in above-ground storage.

The SPR comprises five underground storage facilities, hollowed out from naturally occurring salt domes in Texas and Louisiana. EPCA authorized drawdown of the Reserve upon a finding by the President that there is a “severe energy supply interruption.” Congress enacted additional authority in 1990 (Energy Policy and Conservation Act Amendments of 1990, P.L. 101-383), to permit use of the SPR for short periods to resolve supply interruptions stemming from situations internal to the United States. The meaning of a “severe energy supply interruption” has been controversial. However, EPCA intends use of the SPR only to ameliorate discernible physical shortages of crude oil.

Beginning in 2000, additions to the SPR were made with royalty-in-kind (RIK) oil acquired by the Department of Energy in lieu of cash royalties paid on production from Federal offshore leases. As prices rose during the decade, some policymakers objected to RIK fill, arguing that it was contributing to the pressure on oil prices. The Administration resisted calls to suspend RIK fill until mid-May 2008, shortly after Congress passed legislation (P.L. 110-232) suspending RIK fill for the balance of the calendar year unless the price of crude oil dropped below \$75/barrel. On May 16, DOE canceled its solicitation for an additional 13 million barrels of RIK oil. Standing RIK deliveries were deferred until the period of January-May 2009.

The sharp decline in crude oil prices since spiking to \$147/barrel in the summer of 2008 has spurred interest in resuming fill of the SPR. On January 2, 2009, the Bush Administration announced plans to purchase oil for the SPR, and to reschedule deferred deliveries. There are four components in the resumption of fill: (1) a purchase announced on January 16, 2009, of nearly 10.7 million barrels to replace oil that was sold after Hurricanes Katrina and Rita in 2005; (2) the return of roughly 5.4 million barrels of oil borrowed by refiners after Hurricane Gustav in 2008; (3) delivery of roughly 2.2 million barrels of RIK oil that had been deferred; and (4) resumption of RIK fill in May 2009 at a volume of 26,000 barrels per day, totaling over 6.1 million barrels delivered over a period from May 2009 to January 2010. These activities are intended to fill the SPR to its current capacity of 727 million barrels by early 2010. The government has not acquired oil for the SPR by outright purchase since 1994.

The Energy Policy Act of 2005 (EPACT) required expansion of the SPR to its authorized maximum of 1 billion barrels. Congress approved \$25 million in the FY2008 budget for land acquisition for a site in Richton, Mississippi, that would add 160 million barrels of capacity, but rejected spending for other expansion work. The Administration again sought funds for this purpose in its FY2009 request. The FY2009 request was \$346.9 million, including nearly \$170 million expansion activities. Neither House or Senate appropriations committees favored spending on expansion; the House committee recommended \$172.6 million, and a spending level of \$205 million was established in the Senate. A continuing resolution (P.L. 110-329), running until March 6, 2009, sets spending at FY2008 levels.

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# History of the SPR

## Establishment of the SPR

From the mid-1970s until 2007, world markets have had to absorb roughly five significant spikes in the price of crude oil and petroleum products.<sup>1</sup> Whether driven by disruptions in the physical supply of crude or refined fuels, or by uncertainties owing to international conflicts and instabilities, these price increases have consequences for the United States. Elevated petroleum prices affect the balance of trade and, owing to the relative inelasticity of demand for gasoline at prices less than \$4.00 per gallon, siphon away disposable income that might be spent to support spending, investment, or savings.

The origin of the U.S. Strategic Petroleum Reserve (SPR) stems from the 1973 Arab-Israeli War. In response to the United States' support for Israel, the Organization of Arab Exporting Countries (OAPEC) imposed an oil embargo on the United States, the Netherlands, and Canada, and reduced production. While some Arab crude did reach the United States, the price of imported crude oil rose from roughly \$4/barrel (bbl) during the last quarter of 1973 to an average price of \$12.50/bbl in 1974. While no amount of strategic stocks can insulate any oil-consuming nation from paying the market price for oil in a supply emergency, the availability of strategic stocks can help blunt the magnitude of the market's reaction to a crisis. One of the original perceptions of the value of a strategic stockpile was also that its very existence would discourage the use of oil as a political weapon. The embargo imposed by the Arab producers was intended to create a very discernible physical disruption. This explains, in part, why the genesis of the SPR was focused especially on deliberate and dramatic physical disruptions of oil flow, and on blunting the significant economic impacts of a shortage stemming from international events.

In response to the experience of the embargo, Congress authorized the Strategic Petroleum Reserve in the Energy Policy and Conservation Act (EPCA, P.L. 94-163) to help prevent a repetition of the economic dislocation caused by the Arab oil embargo. In the event of an interruption, introduction into the market of oil from the Reserve was expected to help calm markets, mitigate sharp price spikes, and reduce the economic dislocation that had accompanied the 1973 disruption. In so doing, the Reserve would also buy time for the crisis to sort itself out or for diplomacy to seek some resolution before a potentially severe oil shortage escalated the crisis beyond diplomacy. The SPR was to contain enough crude oil to replace imports for 90 days, with a goal initially of 500 million barrels in storage. In May 1978, plans for a 750-million-barrel Reserve were implemented. The SPR is currently authorized for expansion to 1 billion barrels. The Bush Administration was unsuccessful in persuading Congress to raise the authorized size further to 1.5 billion barrels.

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<sup>1</sup> These have included the Arab oil embargo (1973-1974), the deposing of the Shah of Iran, followed by the Iranian revolution (1979-1980), the first Gulf War (1990), and OPEC production cuts and a resurgence in world oil demand (early 1999 into the fall of 2000). Since 2003, crude oil and product prices have risen to new nominal highs—and, very briefly, a new high in real dollars—owing to a blend of many factors, including international tensions and armed conflicts, as well as worldwide demand. Some of the dynamics behind recent and sustained increases in price owe to factors internal to the United States, including seasonal formulations of gasoline to help meet clean air standards, and strains on U.S. refining capacity. Natural events, such as Hurricanes Rita and Katrina, can also create havoc and alarm in domestic and world markets.

The program is managed by the Department of Energy (DOE). Physically, the SPR comprises five underground storage facilities, hollowed out from naturally occurring salt domes, located in Texas and Louisiana. The caverns were finished by injecting water and removing the brine. Similarly, oil is removed by displacing it with water injection. For this reason, crude stored in the SPR remains undisturbed, except in the event of a sale or exchange. Multiple injections of water, over time, will compromise the structural integrity of the caverns.<sup>2</sup> By 2005, the capacity of the SPR reached 727 million barrels. Its inventory reached nearly 700 million barrels before Hurricanes Katrina and Rita in 2005. Following the storms, some crude was loaned to refiners and some was sold. Loans of SPR oil are “paid” by the return of larger amounts of oil than were borrowed. At the beginning of 2009, the SPR held nearly 702 million barrels.<sup>3</sup>

SPR oil is sold competitively. A Notice of Sale is issued, including the volume, characteristics, and location of the petroleum for sale; delivery dates and procedures for submitting offers; as well as measures for assuring performance and financial responsibility. Bids are reviewed by DOE and awards offered. The Department of Energy estimates that oil could enter the market roughly two weeks after the appearance of a notice of sale.<sup>4</sup>

The Arab oil embargo also fostered the establishment of the International Energy Agency (IEA) to develop plans and measures for emergency responses to energy crises. Strategic stocks are one of the policies included in the agency’s International Energy Program (IEP). Signatories to the IEA<sup>5</sup> are committed to maintaining emergency reserves representing 90 days of net imports, developing programs for demand restraint in the event of emergencies, and agreeing to participate in allocation of oil deliveries among the signatory nations to balance a shortage among IEA members. The calculation of net imports for measuring compliance with the IEA requirement includes private stocks. By that measure, the United States has more than 100 days’ cushion. However, it is likely that less than 20% of the privately held stocks would technically be available in an emergency, because most of that inventory supports movement of product through the delivery infrastructure. The Administration’s advocacy for expansion of the SPR is partly based on this argument that the SPR will need to be larger if the United States is to be able to maintain stocks equivalent to 90 days of net imports. When the SPR is filled to its current capacity of 727 million barrels in early 2010, the United States might have roughly 70 days or more of net import protection, depending upon the course of oil imports during a period of softer demand for petroleum. These measures of days’ protection assumes a total cessation of oil supply to importing nations, a scenario that is highly unlikely. This would be especially true for the United States, given that Canada is currently the nation’s principal source for crude oil.

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<sup>2</sup> Oil stored at one SPR site, Weeks Island, was transferred after problems with the structural integrity of the cavern—unrelated to drawdown activity—were discovered in the mid-1990s.

<sup>3</sup> Details and current levels of SPR inventory are updated regularly at [http://www2.spr.doe.gov/DIR/SilverStream/Pages/pgDailyInventoryReportViewDOE\\_new.html](http://www2.spr.doe.gov/DIR/SilverStream/Pages/pgDailyInventoryReportViewDOE_new.html).

<sup>4</sup> See <http://www.fe.doe.gov/programs/reserves/spr/spr-facts.html>. For more detail on the sales procedure, see U.S. *Federal Register*, Department of Energy, *Price Competitive Sale of Strategic Petroleum Reserve Petroleum; Standard Sales Provisions: Final Rule*, July 27, 2005, pp. 39363-39382; available at [http://www.fe.doe.gov/programs/reserves/spr/spr\\_rule\\_070705.pdf](http://www.fe.doe.gov/programs/reserves/spr/spr_rule_070705.pdf). The Department of Energy has a history of SPR drawdowns, sales, and exchanges on the web at <http://www.fe.doe.gov/programs/reserves/spr/spr-drawdown.html>.

<sup>5</sup> IEA member countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Japan, Republic of Korea, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom, and the United States. See <http://www.iea.org/Textbase/about/membercountries.asp>.

Some IEA member nations require a level of stocks to be held by the private sector or by both the public and private sectors. Including the U.S. SPR, roughly two-thirds of IEA stocks are held by the oil industry, whereas one-third is held by governments and supervisory agencies.<sup>6</sup>

The Energy Policy Act of 2005 (EPACT) requires, “as expeditiously as practicable,” expansion of the SPR to its authorized maximum of 1 billion barrels. Congress approved \$25 million in the FY2008 budget for land acquisition for a site in Richton, Mississippi, that would add 160 million barrels of capacity, but rejected spending for any other expansion work. In FY2009, the Administration once more requested funds for expanding the SPR in its FY2009 request, and the request was once again rejected. The House committee recommended \$172.6 million, and a spending level of \$205 million was recommended to the Senate. A continuing resolution (P.L. 110-329), running until March 6, 2009, sets spending at FY2008 levels. However, FY2009 spending bills may be passed early in the First Session.

## **The Drawdown Authorities**

The Energy Policy and Conservation Act (EPCA, P.L. 94-163) authorizes drawdown of the Reserve upon a finding by the President that there is a “severe energy supply interruption.” This is deemed by the statute to exist if three conditions are joined: If “(a) an emergency situation exists and there is a significant reduction in supply which is of significant scope and duration; (b) a severe increase in the price of petroleum products has resulted from such emergency situation; and (c) such price increase is likely to cause a major adverse impact on the national economy.”

The SPR could be drawn down initially at a rate of roughly 4.3 mbd for up to 90 days; thereafter, the rate would begin to decline. Although fears were expressed periodically during the 1980s about whether the facilities for withdrawing oil from the Reserve were in proper readiness, the absence of problems during the first real drawdown in early 1991 (the Persian Gulf War) appeared to allay much of that concern. However, some SPR facilities and infrastructure were beginning to reach the end of their operational life. A Life Extension Program, initiated in 1993, upgraded or replaced all major systems to ensure the SPR’s readiness to 2025.

Congress enacted additional drawdown authority in 1990 (Energy Policy and Conservation Act Amendments of 1990, P.L. 101-383) after the Exxon Valdez oil spill, which interrupted the shipment of Alaskan oil, triggering spot shortages and price increases. The intention was to provide for an SPR drawdown under a less rigorous finding than that mandated by EPCA. This section, 42 U.S.C. § 6241(h), allows the President to use the SPR for a short period without having to declare the existence of a “severe energy supply interruption” or the need to meet obligations of the United States under the international energy program. As noted previously, the Energy Policy Act of 2005 made the SPR authorities permanent. These authorities also provide for U.S. participation in emergency-sharing activities of the International Energy Agency without risking violation of antitrust law and regulation.

Under the additional authorities authorized in P.L. 101-383, a drawdown may be initiated in the event of a circumstance that “constitutes, or is likely to become, a domestic or international energy supply shortage of significant scope or duration” and where “action taken ... would assist directly and significantly in preventing or reducing the adverse impact of such shortage.” This

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<sup>6</sup> See [http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD\\_ID=4103](http://www.iea.org/Textbase/subjectqueries/keyresult.asp?KEYWORD_ID=4103).

authority allows for a limited use of the SPR. No more than 30 million barrels may be sold over a maximum period of 60 days, and this limited authority may not be exercised at all if the level of the SPR is below 500 million barrels. This was the authority behind the Bush Administration's offer of 30 million barrels of SPR oil on September 2, 2005, which was part of the coordinated drawdown called for by the International Energy Agency. The same authority may have been the model for a swap ordered by President Clinton on September 22, 2000 (see below).

## **Acquisition of Crude Oil for the SPR**

### **Resumption of Fill (2009)**

As is described in greater detail in the sections that follow, legislation (P.L. 110-232) enacted in May 2008 forbade DOE from initiating any new activities to acquire royalty-in-kind (RIK) oil for the SPR during the balance of 2008. The sharp decline in crude oil prices since spiking to \$147/barrel in the summer of 2008 has spurred interest in resuming fill of the SPR. On January 2, 2009, the Bush Administration announced plans to purchase oil for the SPR, and to reschedule deferred deliveries. There are four components in the resumption of fill: (1) a purchase announced on January 16, 2009, of nearly 10.7 million barrels to replace oil that was sold after Hurricanes Katrina and Rita in 2005; (2) the return of roughly 5.4 million barrels of oil borrowed by refiners after Hurricane Gustav in 2008; (3) delivery of roughly 2.2 million barrels of RIK oil that had been deferred; and (4) resumption of RIK fill in May 2009 at a volume of 26,000 barrels per day, totaling over 6.1 million barrels delivered over a period from May 2009 to January 2010. These activities are intended to fill the SPR to its current capacity of 727 million barrels by early 2010. The government has not acquired oil for the SPR by outright purchase since 1994.

### **Fill Rates (1980-1997)**

By the end of 1978, the SPR was supposed to contain 250 million barrels, but it contained only 69 million barrels. When the Iranian revolution cut supplies in the spring of 1979, purchases were suspended to reduce the upward pressure on world oil prices. Filling of the Reserve was resumed in September 1980 following enactment of the Energy Security Act (P.L. 96-294), which established a minimum fill rate of 100,000 barrels per day (b/d). The Reagan Administration accelerated the fill rate to 292,000 b/d in FY1981, but the rate steadily declined to a low of 34,000 b/d in FY1990.

Filling of the SPR was suspended during 1990-1992 after the Iraqi invasion of Kuwait, but it resumed thereafter at a modest rate. Fill declined to 16,500 b/d during FY1994 before being suspended at the end of that fiscal year; by then the SPR held 592 million barrels. Owing to sales of SPR oil during 1996, the level in the Reserve had fallen to 563.5 million barrels by the early spring of 1997.

From 1995 until the latter part of 1998, sales of SPR oil, not acquisition, were at the center of debate. However, the subsequent reduction and brief elimination of the annual federal budget deficit—as well as a precipitous drop in crude oil prices into early 1999—generated new interest in replenishing the SPR, either to further energy security objectives or as a means of providing price support to domestic producers who were struggling to keep higher-cost, marginal production in service. As an initiative to help domestic producers, Secretary of Energy Bill

Richardson requested that the Office of Management and Budget (OMB) include \$100 million in the FY2000 budget request for oil purchases. The proposal was rejected.

## **Royalty-in-Kind Acquisition**

As an alternative to appropriations for the purchase of SPR oil, DOE proposed that a portion of the royalties paid to the government from oil leases in the Gulf of Mexico be accepted “in kind” (in the form of oil) rather than as revenues. The Department of the Interior (DOI) was reported to be unfavorably disposed to the royalty-in-kind (RIK) proposal, but a plan to proceed with such an arrangement was announced on February 11, 1999. (Legislation had also been introduced [H.R. 498] in the 106<sup>th</sup> Congress to direct the Minerals Management Service to accept royalty-in-kind oil.) Producers were supportive, maintaining that the system for valuation of oil at the wellhead is complex and flawed. While acquiring oil for the SPR by RIK avoids the necessity for Congress to make outlays to finance direct purchase of oil, it also means a loss of revenues in so far as the royalties are settled in wet barrels rather than paid to the U.S. Treasury in cash. Final details were worked out during the late winter of 1999.

In mid-November of 2001, President Bush ordered fill of the SPR to 700 million barrels, principally through oil acquired as royalty-in-kind (RIK). At its inception, the RIK plan was generally greeted as a well-intended first step toward filling the SPR to its capacity of 727 million barrels.<sup>7</sup> However, it became controversial when crude prices began to rise sharply in 2002. Some policymakers and studies asserted that diverting RIK oil to the SPR instead of selling it in the open market was putting additional pressure on crude prices. Deposit of 40 million barrels into the SPR during 2002 was criticized in a report released on March 5, 2003, by Senator Levin, representing the minority on the Permanent Subcommittee on Investigations of the Senate Committee on Governmental Affairs.<sup>8</sup> The study argued that this increment of fill had been a major contributor to oil price increases during that year. A number of industry analysts quickly dismissed the study, arguing that the quantity of SPR fill was not enough to have driven the market. One of the most vocal critics of RIK fill, energy economist Philip K. Verleger, Jr., argued that SPR fill is one of two reasons that crude oil prices were exceeding \$90/barrel during the latter part of 2007. In a commentary released in January 2008, Verleger estimated that, were the Administration to cease depositing sweet crude into the SPR, “crude prices would ease dramatically were this to happen, possibly to \$70 per barrel.”<sup>9</sup> The Administration strongly disagreed with claims that RIK fill bore responsibility for the continuing spike in prices, arguing in part that market fluctuations both take and restore crude supply to world markets without affecting prices at the scale that were implied by Verleger’s assumptions.

Legislative attempts to suspend RIK fill began in 2004, during the 108<sup>th</sup> Congress. An amendment to the FY2005 Interior Appropriations Bill (H.R. 4568) to suspend RIK deliveries and cap the SPR at 647 million barrels was defeated on the House floor (152-267) on June 17, 2004. Another effort to suspend RIK deliveries to the SPR occurred on September 14, 2004, during debate on

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<sup>7</sup> The SPR estimated capacity of 727 million barrels followed a reevaluation of the cavern formations and other work. Water injections into caverns when oil has been moved have added capacity, as did completion of a project to remove excess gas from stored petroleum.

<sup>8</sup> U.S. Strategic Petroleum Reserve: Recent policy Has Increased Costs To Consumers But Not Overall U.S. Energy Security; available at [http://hsgac.senate.gov/\\_files/sprt10818petro\\_reserves.pdf](http://hsgac.senate.gov/_files/sprt10818petro_reserves.pdf).

<sup>9</sup> Prices at this time were in the realm of the mid-\$80 per barrel. Verleger commentary available at <http://www.pkverlegerllc.com/PKV%20Made%20in%20the%20USA%20Op-Ed.pdf>.



H.R. 4567, the FY2005 Department of Homeland Security Appropriations Bill. Senator Byrd proposed suspension of RIK fill in order to provide \$470 million in additional funding for homeland security purposes. The amendment was set aside. Despite the continued opposition to RIK fill of some policy makers, the Administration continued with it until August 2005, when the SPR held fractionally less than 700 million barrels. Deliveries of RIK oil were suspended in August 2005 after Hurricanes Rita and Katrina.

The Administration had suspended RIK oil on other occasions in the past. In light of tightness in world oil markets and increasing prices, the Bush Administration agreed to delay deliveries scheduled for late 2002 and the first months of 2003. The Administration had intended to boost deliveries to the SPR to 130,000 barrels per day during April 2003, a total of 3.9 million barrels. But, on March 4, 2003, DOE delayed delivery of all but 15,000 b/d of RIK oil. With the declared end of the military phase of the war in Iraq and little effect on oil markets, deliveries of RIK oil were resumed, as well as delivery of oil still owed from a “swap” held in 2000 (described in detail below).

The Energy Policy Act of 2005 (P.L. 109-58), enacted in the summer of 2005, required the Secretary of Energy to develop and publish for comment procedures for filling the SPR that take into consideration a number of factors. Among these are the loss of revenue to the Treasury from accepting royalties in the form of crude oil, how the resumed fill might affect prices of both crude and products, and whether additional fill would be justified by national security. It is likely that these provisions of P.L. 109-58 were a partial consequence of the debate over the wisdom of RIK fill. On November 8, 2006, DOE issued its final rule, “Procedures for the Acquisition of Petroleum for the Strategic Petroleum Reserve.” The rule essentially indicated that DOE would take into account all the parameters required by P.L. 109-58 to be taken into consideration before moving ahead with any acquisition strategy. DOE rejected tying decisions to acquire oil to any specific, measurable differentials in current and historic oil prices.

In the summer of 2007, DOE resumed RIK fill of the SPR, after soliciting and accepting bid for delivery of 8.7 million barrels of oil from Shell at a rate of roughly 50,000 b/d over a six-month period. On October 10, 2007, DOE issued a solicitation for an additional 13 million barrels of RIK oil and, in early November, contracts were awarded for 12.3 million barrels of RIK oil to Shell Trading Company, Sunoco Logistics, and BP North America.

Bills to suspend RIK fill (H.R. 5146, S. 2598) were introduced early in the second session of the 110<sup>th</sup> Congress. Introduction of these bills may have been driven, in part, by dissatisfaction with the November 2006 Administration rule responding to the provisions in EPACT requiring the Administration to specify how it would determine that RIK fill would not affect product prices and markets.

In May 2008, with gasoline prices exceeding, on average, \$3.60 gallon, and approaching \$4.00/gallon in some regions, more policymakers expressed support for halting RIK deliveries. On May 13, the Senate, by a vote of 97-1, approved suspension of RIK fill during the balance of 2008 as an amendment to a flood insurance bill (H.R. 3121) that was subsequently passed (92-6). The amendment would permit resumption of RIK fill if crude oil fell to \$75/barrel, on average, for a 90-day period. The House approved a similar proposal (H.R. 6022) that evening by a vote of 385-25. The Senate then approved the House bill by unanimous consent. President Bush indicated that he would not veto the legislation. President Bush signed the legislation into law (P.L. 110-232) on May 19, 2008. However, a few days earlier, on May 16, DOE announced it would not

accept bids for an additional 13 million barrels of RIK oil that had been intended for delivery during the second half of 2008.

At the time of congressional passage of H.R. 6022, deliveries of RIK oil were scheduled through July 2008, and DOE had invited bids for additional fill through December 2008. Through FY2007, royalty-in-kind deliveries to the SPR totaled roughly 140 million barrels and forgone receipts to the Department of Interior an estimated \$4.6 billion. DOE had estimated deliveries of 19.1 million barrels of RIK oil during FY2008 and \$1.170 billion in forgone revenues.<sup>10</sup>

Opponents of RIK fill in the 110<sup>th</sup> Congress were not necessarily opposed to the concept of an SPR. When the price of crude was much less of an issue, objections to RIK fill were also ideological. Opponents of RIK fill in principle contended that a government-owned strategic stock of petroleum is inappropriate under any circumstance—that it essentially saddles the public sector with the expense of acquiring and holding stocks, the cost for which might have otherwise been borne by the private sector. The existence of the SPR, this argument goes, has blunted the level of stocks held in the private sector.<sup>11</sup>

The sharp decline in crude oil prices from over \$140/barrel in the summer of 2008 to less than \$40 per barrel in late December 2008 heightened interest in resuming fill during 2009. In mid-January 2009, the Bush Administration announced that RIK fill of the SPR would resume in May 2009 at an estimated rate of roughly 26,000 b/d, continuing into January 2010. The rate of RIK deliveries over the lifetime of the program has varied. The rate announced in January 2009 is, in general, modest in comparison to delivery rates seen in the past. However, the new RIK fill, along with deliveries of oil that had been deferred, as well as an outright purchase of nearly 10.7 million barrels, is designed to fill the SPR to its current capacity by early 2010.

## **Use of the SPR: Hurricanes Ivan, Katrina, and Rita (2004-2005)**

The additional drawdown authorities enacted in P.L. 101-383 were the basis for using SPR resources during the hurricanes of 2004-2005. Crude oil prices exceeded \$50/barrel during October 2004, accompanied by declines in crude and product inventories. A major factor was Hurricane Ivan, which rampaged through the Gulf Coast in mid-September and temporarily interrupted more than 70% of offshore crude production, affecting crude oil deliveries to refineries. On September 23, 2004, the Administration agreed to a request placed to the Department of Energy from a couple of refineries seeking to borrow crude oil from the SPR, to be replaced within a short period of time. Subsequent requests raised the amount of borrowed crude to roughly 5.4 million barrels. Requests to borrow oil are contingent upon a greater volume of crude to be returned to the SPR. This is in keeping with the mechanics of a “swap” of oil conducted in 2002 under comparable circumstances.

Critics claimed that it was a belated and insufficient use of the SPR, and that it even backfired in terms of calming the market. However, because the swap was limited and sharply focused, and

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<sup>10</sup> Owing to suspension of RIK fill after the passage of legislation in May 2008, these figures will be significantly lower. Annual figures for RIK deliveries through FY2006 may be found in the Strategic Petroleum Reserve Annual Report for FY2006, p. 39: [http://www.fossil.energy.gov/programs/reserves/publications/Pubs-SPR/spr\\_annual\\_rpt\\_06.pdf](http://www.fossil.energy.gov/programs/reserves/publications/Pubs-SPR/spr_annual_rpt_06.pdf). Estimates for FY2008 furnished in a communication from DOE.

<sup>11</sup> See, for example, Taylor, Jerry and Van Doren, Peter, “The Case Against the Strategic Petroleum Reserve,” *Policy Analysis*, No. 555, November 21, 2005.

represented such a tiny volume of oil, it may have been a misinterpretation to see it as intended to do anything more than it did—which was to provide supply to refiners to whom deliveries of crude were temporarily affected by Hurricane Ivan. The Administration argued that the decision to loan oil to these refineries was consistent with its overall SPR policy not to suspend fill or to authorize a broader drawdown for the purpose of reducing high prices. The swap was not characterized as a broader market-calming measure. The fact that the price of oil rose even after the announcement was a reflection of much stronger factors and uncertainties then prevailing in world markets than could be offset by such a limited swap.

Hurricanes Katrina and Rita in 2005 shut down oil and gas production from the Outer Continental Shelf in the Gulf of Mexico, the source for 25% of U.S. crude oil production and 20% of natural gas output. Katrina, which made landfall on August 29, 2005, resulted in the shutdown of most crude oil and natural gas production in the Gulf of Mexico, as well as a great deal of refining capacity in Louisiana and Alabama. Offshore oil and gas production was resuming when Hurricane Rita made landfall on September 24, and an additional 4.8 million barrels per day of refining capacity in Texas and nearby Louisiana was closed.

Combining the effects of both storms, 1.3 mbd of refining—about 8% of national capability—was shut down, reducing the supply of domestically refined fuels commensurately. Much of the refined product shortfall was made up by imports of refined products, some of which were made available by strategic supplies released by International Energy Agency (IEA) member nations on September 2. As part of the IEA drawdown, 30 million barrels of crude oil were made available from the SPR, which holds only crude. Only 11 million barrels was sold from the SPR, in part because limited refinery capacity reduced the call on crude.

## **When Should the SPR Be Used?: The Debate Over the Years**

The history of the SPR traces differences of opinion over what could be deemed a “severe energy supply interruption.” As has been noted, the original intention of the SPR was to create a reserve of crude oil stocks that could be tapped in the event of an interruption in crude supply. However, in the last few years, there have been increases in the price of products independent of crude prices, as well as increases in crude prices that correlate to “tight” markets, but not to measurable shortages in crude supply.<sup>12</sup>

A debate during the 1980s over when, and for what purpose, to initiate a drawdown of SPR oil reflected the significant shifts that were taking place in the operation of oil markets after the experiences of the 1970s, and deregulation of oil price and supply. Sales of SPR oil authorized by the 104<sup>th</sup> Congress—and in committee in the 105<sup>th</sup>—renewed the debate for a time.<sup>13</sup> The rise in oil prices from 2005-2008 renewed interest in the debate over the appropriate time to call upon the SPR.

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<sup>12</sup> One article in the trade press describes the oil market as driven by “tight fundamentals.” See *Little Relief Seen from Tight Fundamentals*, Oil Daily, November 1, 2007: p. 1-2.

<sup>13</sup> These were sales ordered by Congress as deficit-reduction measures. For a chronology of these sales, see <http://www.fe.doe.gov/programs/reserves/spr/spr-drawdown.html>.

The SPR Drawdown Plan, submitted by the Reagan Administration in late 1982, provided for price-competitive sale of SPR oil. The plan rejected the idea of conditioning a decision to distribute SPR oil on any “trigger” or formula. To do so, the Administration argued, would discourage private sector initiatives for preparedness or investment in contingency inventories. Many analysts, in and out of Congress, agreed with the Administration that reliance upon the marketplace during the shortages of 1973 and 1979 would probably have been less disruptive than the price and allocation regulations that were imposed. But many argued that the SPR should be used to moderate the price effects that can be triggered by shortages like those of the 1970s or the tight inventories experienced during the spring of 1996, and lack of confidence in supply availability. Early drawdown of the SPR, some argued, was essential to achieve these objectives.

The Reagan Administration revised its position in January 1984, announcing that the SPR would be drawn upon early in a disruption. This new policy was hailed as a significant departure, considerably easing congressional discontent over the Administration’s preparedness policy, but it also had international implications. Some analysts began to stress the importance of coordinating stock drawdowns worldwide during an emergency lest stocks drawn down by one nation merely transfer into the stocks of another and defeat the price-stabilizing objectives of a stock drawdown. In July 1984, responding to pressure from the United States, the International Energy Agency agreed “in principle” to an early drawdown, reserving decisions on “timing, magnitude, rate and duration of an appropriate stockdraw” until a specific situation needed to be addressed.

### **Use of the SPR in the Persian Gulf War (1990)**

This debate was revisited in the aftermath of the Iraqi invasion of Kuwait on August 2, 1990. The escalation of gasoline prices and the prospect that there might be a worldwide crude shortfall approaching 4.5-5.0 million barrels daily prompted some to call for drawdown of the SPR. The debate focused on whether SPR oil should be used to moderate anticipated price increases, before oil supply problems had become physically evident.

In the days immediately following the Iraqi invasion of Kuwait, the George H. W. Bush Administration indicated that it would not draw down the SPR in the absence of a physical shortage simply to lower prices. On the other hand, some argued that a perceived shortage does as much and more immediate damage than a real one, and that flooding the market with stockpiled oil to calm markets is a desirable end in itself. From this perspective, the best opportunity to use the SPR during the first months of the crisis was squandered. It became clear during the fall of 1990 that in a decontrolled market, physical shortages are less likely to occur. Instead, shortages are likely to be expressed in the form of higher prices, as purchasers are free to bid as high as they wish to secure scarce supply.

Within hours of the first air strike against Iraq in January 1991, the White House announced that President Bush was authorizing a drawdown of the SPR, and the IEA activated the plan on January 17. Crude prices plummeted by nearly \$10/barrel in the next day’s trading, falling below \$20/bbl for the first time since the original invasion. The price drop was attributed to optimistic reports about the allied forces’ crippling of Iraqi air power and the diminished likelihood, despite the outbreak of war, of further jeopardy to world oil supply. The IEA plan and the SPR drawdown did not appear to be needed to help settle markets, and there was some criticism of it. Nonetheless, more than 30 million barrels of SPR oil was put out to bid, but DOE accepted bids deemed reasonable for 17.3 million barrels. The oil was sold and delivered in early 1991.

The Persian Gulf War was an important learning experience about ways in which the SPR might be deployed to maximize its usefulness in decontrolled markets. As previously noted, legislation enacted by the 101<sup>st</sup> Congress, P.L. 101-383, liberalized drawdown authority for the SPR to allow for its use to prevent minor or regional shortages from escalating into larger ones; an example was the shortages on the West Coast and price jump that followed the Alaskan oil spill of March 1989. In the 102<sup>nd</sup> Congress, omnibus energy legislation (H.R. 776, P.L. 102-486) broadened the drawdown authority further to include instances where a reduction in supply appeared sufficiently severe to bring about an increase in the price of petroleum likely to “cause a major adverse impact on the national economy.” The original EPCA authorities permit “exchanges” of oil for the purpose of acquiring additional oil for the SPR. Under an exchange, a company borrows SPR crude and later replaces it, including an additional quantity of oil as a premium for the loan. There have been seven exchanges from 1996 through 2005, the most recent ones following Hurricanes Katrina and Rita.

A new dimension of SPR drawdown and sale was introduced by the Clinton Administration’s proposal in its FY1996 budget to sell 7 million barrels to help finance the SPR program. While agreeing that a sale of slightly more than 1% of SPR oil was not about to cripple U.S. emergency preparedness, some in the Congress vigorously opposed the idea, in part because it might establish a precedent that would bring about additional sales of SPR oil for purely budgetary reasons, as did indeed occur. There were three sales of SPR oil during FY1996. The first was to pay for the decommissioning of the Weeks Island site. The second was for the purpose of reducing the federal budget deficit, and the third was to offset FY1997 appropriations. The total quantity of SPR sold was 28.1 million barrels, and the revenues raised were \$544.7 million. Fill of the SPR with RIK oil was initiated in some measure to replace the volume of oil that had been sold during this period.

### **Hurricanes and Changes in the Market Dynamics (2005-2008)**

Prior to Hurricanes Ivan, Katrina, and Rita in 2005, growth in oil demand had begun to strap U.S. refinery capacity. A result has been an altering in a once-observed historic correlation between crude oil and refined oil product prices. In the past, changes in the price of crude had driven changes in the cost of refined products. The assumption that product prices are driven by, and follow the path of, crude prices, was at the center of debates from the 1980s until early in the decade of 2000 whether an SPR drawdown was warranted when prices spiked.

However, beginning in the middle of the first decade of the new century, pressure on product supplies and the accompanying anxiety stoked by international tensions caused a divorce in that traditional correlation between crude and product prices. The increases in prices of gasoline and other petroleum products following Hurricanes Katrina and Rita, for example, were not a response to any shortage of crude, but to shortages of products owing to the shutdown of major refining capacity in the United States, and to an interruption of product transportation systems.

The rise in crude prices to over \$140/barrel by the summer of 2008 were attributable to many contributing factors, including increasing international demand, and concern that demand for crude might outstrip world production. Markets were described as “tight,” meaning that there might be little cushion in terms of spare production capacity to replace any crude lost to the market, or to provide adequate supply of petroleum products. In such a market, where demand seems to be brushing against the limits to meet that demand, refinery outages, whether routine or unexpected, can spur a spike in crude and product prices, as can weekly reports of U.S. crude and petroleum stocks, if the numbers reported are not consistent with expectations. As prices

continued to increase during 2007-2008, some argued that market conditions did not support the high prices. One market analyst remarked at the end of October 2007, “The market at this stage totally ignores any bearish news [that would soften the price of oil], but it tends to exaggerate bullish news.”<sup>14</sup> Significant and sustained increases in oil prices were observed in the absence of the sort of “severe energy supply interruption” that remains the basis for use of the SPR.

### **The Call for an SPR Drawdown: Summer 2008**

Some policymakers were urging the Administration to release oil from the SPR during the spring and summer of 2008. A review of the dynamics in the oil market during this period provides a demonstration of why an SPR release in the face of high prices will not necessarily foster a decline in petroleum prices.

By mid-July 2008, U.S. gasoline prices were exceeding \$4.00/gallon and diesel fuel was averaging \$4.75/gallon. Crude oil prices had briefly exceeded more than \$145/barrel, but declined late in the month to less than \$128/barrel. Oil prices had risen in recent years in the absence of the normal association with the concept of “disruption” or “shortage.” The escalation in prices to their observed peak in July 2008 were driven by several factors that are difficult to weigh. Chief among them was the existence of little or no spare oil production capacity worldwide, and a general inelasticity in demand for oil products despite high prices. Prices also generally prove sensitive to the ebb and flow of international tensions, the value of the U.S. dollar, and even the appearance of storms that could develop into hurricanes that might make landfall in the Gulf of Mexico.

In the months prior to Hurricanes Gustav and Ike, there were some calls for an SPR drawdown despite the absence of any discernible shortage. On July 24, 2008, legislation (H.R. 6578) to require a 10% drawdown of SPR oil failed to achieve a two-thirds majority in the House under suspension of the rules (226-190). The language was included in H.R. 6899, the Comprehensive American Energy Security and Consumer Protection Act, which passed the House on September 16<sup>th</sup> (236-189).

The bill would have required a sale of 70 million barrels of light grade petroleum from the SPR within six months following enactment. The bill stipulated that 20 million barrels must be offered for sale during the first 60 days. All oil from the sale would be replaced with “sour” crude to be acquired after the six-month sale period, with the replacement acquisition completed not later than five years after enactment.

The genesis of the proposal lay partly in an analysis by the Government Accountability Office, which observed that the proportion of grades of oil in the SPR was not as compatible as it could be with the trend of refineries toward being able to handle heavier grades of crudes. Refiners reported to GAO that running lighter crude in units designed to handle heavy crudes could impose as much as an 11% penalty in gasoline production and 35% in diesel production. The agency reported that other refiners indicated that they might have to shut down some of their units.<sup>15</sup>

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<sup>14</sup> Oil Daily, October 30, 2007. *Crude Continues Its Rally as Storm Hits Mexican Crude Exports*: p. 3.

<sup>15</sup> See Government Accountability Office. *Options for Improving the Cost-Effectiveness of Filling the Reserve*. February 2008. GAO-08-521T. <http://www.gao.gov/new.items/d08521t.pdf>. An additional benefit to acquiring heavier grades of crude is that it is less expensive.

It was unclear what sort of effect a roughly 70 million barrel draw on the SPR would have on prices. In a market where there is no physical shortage, oil companies may have limited interest in SPR oil unless they have spare refining capacity to turn the crude into useful products, or want to build crude oil stocks.<sup>16</sup> SPR oil is not sold at below-market prices. Bids on SPR oil are accepted only if the bids are deemed fair to the U.S. government. If the announcement itself that the SPR is going to be tapped does not prompt or contribute to a softening of prices, there may be limited interest on the part of the oil industry in bidding on SPR supply. Although the possibility exists that prices might decline if additional refined product is released into the market, it was impossible to predict what effect an SPR drawdown would have had on oil prices at any time in 2008, given the many other factors that bear on daily oil prices.

There were additional considerations. A unilateral draw on U.S. stocks will probably have less impact on the world oil market than a coordinated international drawdown of the sort that occurred after Hurricanes Katrina and Rita in 2005. Some might argue that it would be unwise under any scenario for the U.S. to draw down its strategic stocks while other nations continue to hold theirs at current levels. Additionally, it is always possible that producing nations might reduce production to offset any SPR oil delivered into the market. In the setting of 2008, producing, exporting nations could have argued that the market was already well-supplied and that short-term supply concerns were not what was supporting elevated prices.

The SPR has been perceived as a defensive policy tool against high oil prices, but if it is used without a discernible impact on oil prices, it is possible that the SPR will lose some of whatever psychological leverage it exercises on prices when left as an untapped option.

## **Establishment of a Regional Home Heating Oil Reserve**

Although a number of factors contributed to the virtual doubling in some Northeastern locales of home heating oil prices during the winter of 1999-2000, one that drew the particular attention of lawmakers was the sharply lower level of middle distillate stocks—from which both home heating oil and diesel fuels are produced—immediately beforehand. It renewed interest in establishment of a regional reserve of home heating oil. EPCA includes authority for the Secretary of Energy to establish regional reserves as part of the broader Strategic Petroleum Reserve. With support from the Clinton Administration, Congress moved to specifically authorize and fund a regional heating oil reserve in the Northeast. The FY2001 Interior Appropriations Act (P.L. 106-291) provided \$8 million for the Northeast Heating Oil Reserve (NHOR). The regional reserve was filled by the middle of October 2000 at two sites in New Haven, CT, and terminals in Woodbridge, NJ, and Providence, RI. The NHOR is intended to provide roughly 10 days of Northeast home heating oil demand.

There was controversy over the language that would govern its use. Opponents of establishing a regional reserve suspected that it might be tapped at times that some consider inappropriate, and that the potential availability of the reserve could be a disincentive for the private sector to

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<sup>16</sup> Use of refining capacity has been running at generally observed averages, taking into account seasonal maintenance and other events that will take refinery units offline temporarily. See Table 2 at [http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/weekly\\_petroleum\\_status\\_report/wpsr.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/wpsr.html).

maintain inventories as aggressively as it would if there were no reserve. The approach enacted predicated drawdown on a regional supply shortage of “significant scope and duration,” or if—for seven consecutive days—the price differential between crude oil and home heating oil increased by more than 60% over its five-year rolling average. The intention was to make the threshold for use of the regional reserve high enough so that it would not discourage oil marketers and distributors from stockbuilding. The President may also authorize a release of the NHOR in the event that a “circumstance exists (other than the defined dislocation) that is a regional supply shortage of significant scope and duration,” the adverse impacts of which would be “significantly” reduced by use of the NHOR.

During mid- and late December 2000, the 60% differential was breached. However, this was due to a sharp decline in crude prices rather than to a rise in home heating oil prices. In fact, home heating oil prices were drifting slightly lower during the same reporting period. As a consequence, while the 60% differential was satisfied, other conditions prerequisite to authorizing a drawdown of the NHOR were not.

A general strike in Venezuela that began in late 2002 resulted, for a time, in a loss of as much as 1.5 million barrels of daily crude supply to the United States. With refinery utilization lower than usual owing to less crude reaching the United States, domestic markets for home heating oil had to rely on refined product inventories to meet demand during a particularly cold winter. Prices rose, and there were calls for use of the NHOR; still, the price of heating oil fell significantly short of meeting the guidelines for a drawdown.<sup>17</sup> In connection with the FY2004 Interior appropriations, both the House and Senate Appropriations Committees included language in their committee reports directing that DOE advise Congress as to the “circumstances” under which the NHOR might be used. The provision implied that some in Congress were not satisfied with the formula currently in place that would permit drawdown of the NHOR. The language was not included in the final FY2004 Interior appropriations bill. As the sharp increases in home heating oil prices during 2005 are averaged into the five-year rolling average, the price differential needed to trigger use of the NHOR will increase further. However, the President can invoke the authorities for an NHOR drawdown even if the price threshold is not met.

## **Author Contact Information**

Robert Bamberger  
Specialist in Energy Policy  
rbamberger@crs.loc.gov, 7-7240

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<sup>17</sup> During the heating oil season, DOE updates and posts a weekly table that shows the various inputs that go into the calculation to determine the current differential, [http://www.fe.doe.gov/programs/reserves/heatingoil/Sales\\_Basis\\_0506.html](http://www.fe.doe.gov/programs/reserves/heatingoil/Sales_Basis_0506.html).