



**CONGRESSIONAL BUDGET OFFICE
COST ESTIMATE**

September 15, 2008

**S. 3270
National Aeronautics and Space Administration
Authorization Act of 2008**

*As reported by the Senate Committee on Commerce, Science, and Transportation
on July 16, 2008*

SUMMARY

S. 3270 would specifically authorize the appropriation of \$20.6 billion for activities of the National Aeronautics and Space Administration (NASA) for 2009. Under the bill, CBO estimates that NASA also would require an additional \$300 million for one additional space shuttle flight in addition to those currently planned. CBO further estimates that other federal agencies, such as the National Oceanic and Atmospheric Administration (NOAA), the Office of Science and Technology Policy (OSTP), and the Department of Defense, would need an additional \$2 million over the 2009-2010 period for the bill's new planning and reporting requirements related to space research. Assuming appropriation of the authorized and necessary amounts, CBO estimates that implementing S. 3270 would cost \$20.7 billion over the 2009-2013 period.

S. 3270 would require NASA to complete all 10 planned space shuttle flights, plus at least one additional flight as authorized by the legislation, even if that would require extending the program beyond 2010. Based on information provided by NASA, CBO expects that all 11 space shuttle flights would be completed by the end of 2010 when the Administration plans to end the space shuttle program. Therefore, CBO's cost estimate for S. 3270 does not include any additional costs for continuing the space shuttle after 2010. Should NASA need to continue space shuttle operations in 2011, however, information provided by NASA indicates that such activities would cost approximately \$3 billion a year. NASA would need to maintain a similar level of funding in 2011 and beyond if additional time were need to complete all planned shuttle flights.

Enacting S. 3270 could increase revenues from donations to a new International Space Station (ISS) research fund and direct spending of amounts from that fund. CBO estimates that any such effects would have an insignificant net impact on the federal budget.

S. 3270 contains no intergovernmental or private-sector mandates as defined in the Unfunded Mandates Reform Act (UMRA) and would impose no costs on state, local, or tribal governments.

ESTIMATED COST TO THE FEDERAL GOVERNMENT

The estimated budgetary impact of S. 3270 is shown in the following table. The costs of this legislation fall within budget functions 250 (general science, space, and technology), 300 (natural resources and environment), and 800 (general government).

	By Fiscal Year, in Millions of Dollars					2009-2013
	2009	2010	2011	2012	2013	
CHANGES IN SPENDING SUBJECT TO APPROPRIATION^a						
National Aeronautics and Space Administration:						
Space Operations						
Estimated Authorization Level	6,225	150	0	0	0	6,375
Estimated Outlays	4,630	1,593	76	30	0	6,329
Science						
Authorization Level	4,932	0	0	0	0	4,932
Estimated Outlays	2,861	1,726	197	49	49	4,882
Exploration						
Authorization Level	3,886	0	0	0	0	3,886
Estimated Outlays	1,904	1,788	78	38	38	3,846
Cross-Agency Support						
Authorization Level	3,300	0	0	0	0	3,300
Estimated Outlays	1,782	1,485	33	0	0	3,300
Human Space Flight Gap						
Authorization Level	1,000	0	0	0	0	1,000
Estimated Outlays	740	240	10	5	0	995
Aeronautics						
Authorization Level	853	0	0	0	0	853
Estimated Outlays	410	393	26	9	9	847
Education						
Authorization Level	128	0	0	0	0	128
Estimated Outlays	15	54	33	18	6	126

Continued

	By Fiscal Year, in Millions of Dollars					2009- 2013
	2009	2010	2011	2012	2013	
CHANGES IN SPENDING SUBJECT TO APPROPRIATION^a (Continued)						
Inspector General						
Authorization Level	36	0	0	0	0	36
Estimated Outlays	31	5	0	0	0	36
Other NASA Programs						
Authorization Level	350	0	0	0	0	350
Estimated Outlays	209	128	6	3	2	348
Subtotal						
Estimated Authorization Level	20,710	150	0	0	0	20,860
Estimated Outlays	12,581	7,411	458	152	104	20,709
Other Agencies						
Estimated Authorization Level	2	*	0	0	0	2
Estimated Outlays	2	*	0	0	0	2
Total Changes						
Estimated Authorization Level	20,712	150	0	0	0	20,862
Estimated Outlays	12,583	7,411	458	152	104	20,711

Note: * = less than 500,000.

a. Enacting S. 3270 could increase revenues from donations to a new International Space Station (ISS) research fund and direct spending of amounts from that fund. CBO estimates that any such effects would have an insignificant net impact on the federal budget.

BASIS OF ESTIMATE

For this estimate, CBO assumes that S. 3270 will be enacted near the beginning of 2009 and that the entire amounts authorized and estimated to be necessary will be appropriated. CBO also assumes that for the 2010-2013 period, subsequent legislation would authorize appropriations to continue the ongoing activities of NASA. Finally, CBO assumes that all the space shuttle flights planned by NASA will be completed by the end of 2010. Estimated outlays are based on historical spending patterns for existing programs.

S. 3270 would specifically authorize the appropriation of \$20.6 billion for activities of NASA in 2009. CBO estimates that NASA would need an additional \$300 million over the 2009-2010 period for an additional space shuttle flight authorized by section 10. Other federal agencies would need about \$2 million for reporting and planning requirements over

the 2009-2010 period. Assuming appropriation of the authorized and necessary amounts, CBO estimates that implementing S. 3270 would result in discretionary outlays of \$20.7 billion over the 2009-2013 period.

National Aeronautics and Space Administration

For 2008, NASA received an appropriation of \$17.3 million to fund its activities. For 2009, S. 3270 would specifically authorize the appropriation of \$20.6 billion for NASA's programs. CBO estimates that NASA would need an additional \$300 million for an additional space shuttle flight, some of which could be provided in 2010. In total, CBO estimates that implementing provisions related to NASA would cost \$20.7 billion over the 2009-2013 period.

Space Operations. The bill would specifically authorize the appropriation of \$6.1 billion in 2009 primarily to support the International Space Station (ISS) and space shuttle activities. It would require NASA to complete the shuttle's current planned missions, which include 10 flights, regardless of the shuttle's planned retirement date at the end of 2010. Information provided by NASA indicates that the shuttle will likely complete its remaining missions by the end of 2010, assuming no unforeseen problems.

Section 10 also would require NASA to fly an additional shuttle mission, not currently planned, to deliver the alpha magnetic spectrometer—a scientific instrument—and other scientific payloads to the ISS. Based on information provided by NASA, that flight would occur in the summer of 2010 and would cost about \$300 million—\$150 million in 2009 to plan the flight and \$150 million in 2010 to fly the mission.

Assuming appropriation of the authorized and necessary amounts for space operations, CBO estimates that implementing those provisions would cost \$6.3 billion over the 2009-2013 period.

Other NASA Programs. The remaining specified authorizations of appropriations under S. 3270 include:

- *Science:* \$4.9 billion for Earth research and planetary science, planetary radar observations, astrophysics, heliophysics, and suborbital research, and support of the Mars exploration program;
- *Exploration:* \$3.9 billion to support the Ares I launch and Orion crew vehicles, lunar precursor robotic program, exploration risk mitigation research, and other exploration technology;

- *Cross-Agency Support*: \$3.3 billion to support NASA's nine field centers, the innovative partnership program, facilities and laboratory construction and maintenance, and NASA's other general and administrative activities;
- *Human Space Flight Gap*: \$1 billion to accelerate the initial operating capability of the next-generation space shuttle and associated ground support and launch systems;
- *Aeronautics*: \$853 million to research and develop aircraft safety and capabilities, (including evaluating airspace, space weather, and environmental concerns), create a joint aeronautics research and development advisory council, and award university grants;
- *Education*: \$128 million to attract and retain students in the fields of science, technology, engineering, and mathematics;
- *Inspector General*: \$36 million to conduct investigations into the ongoing operations of the agency; and
- *Other NASA Activities*: \$200 million would be used for a new ISS research fund, and \$150 would fund a private-sector competition to develop a new commercial crew vehicle to reach the ISS.

Potential Additional Costs for Space Shuttle Activities

Section 5 would require NASA to fly all currently planned space shuttle flights (including the mission to deliver the alpha spectrometer plus any additional flights as authorized by subsequent legislation), irrespective of the planned retirement date for the space shuttle of September 30, 2010. The bill also would require NASA to terminate or suspend any activity that would preclude the continued safe and effective flight of the space shuttle after 2010.

CBO assumes that the planned flights and the new mission to deliver the alpha spectrometer would be completed by the end of 2010, and our cost estimate reflects that assumption. However, should NASA need to continue space shuttle operations in 2011, information provided by NASA indicates that such activities would cost approximately \$3 billion. That amount is similar to its current funding level for the shuttle program. NASA would need to maintain a similar level of funding and operation beyond 2011 if additional time were needed to complete all shuttle flights.

Other Federal Agencies

CBO estimates that an additional \$2 million over the 2009-2013 period would be necessary under the bill for other federal agencies, including NOAA, OSTP, the Department of State, and the Department of Defense, for planning and reporting requirements concerning export control policies in the aerospace industry; methane inventory; commercial space-range options; and other space-related issues.

INTERGOVERNMENTAL AND PRIVATE-SECTOR IMPACT

S. 3270 contains no intergovernmental or private-sector mandates as defined in UMRA and would benefit public institutions of higher education by authorizing grants to establish Centers for Research on Aviation Training and authorizing \$32 million in fiscal year 2009 for the National Space Grant College and Fellowship Program. Any costs to state, local, or tribal governments would result from complying with conditions of aid.

PREVIOUS CBO ESTIMATE

On June 6, 2008, CBO transmitted a cost estimate for H.R. 6063, the National Aeronautics and Space Administration Authorization Act of 2008, as ordered reported by the House Committee on Science and Technology on June 4, 2008. Although the bills are similar, S. 3270 contains additional authorizations of appropriations, some of which extend beyond 2009, for certain NASA activities including an additional space flight, a new ISS Research Fund, and private-sector competition to develop a new commercial crew vehicle to reach the ISS. S. 3270 also would have an insignificant net effect on revenues and direct spending (H.R. 6063 has no such effects) because it includes a provision to allow NASA to accept and spend donations for ISS research. The CBO estimates for the bills reflect those differences.

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