

U.S. Department of Energy



Office of Science

# U.S. Department of Energy Office of Science



## *Update from DOE's Office of Science*

NSLS-CFN Joint Users' Meeting

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## *Congratulations to ...*

- **The Center for Functional Nanomaterials, which successfully completed CD-4b on March 21<sup>st</sup>, 2008.**

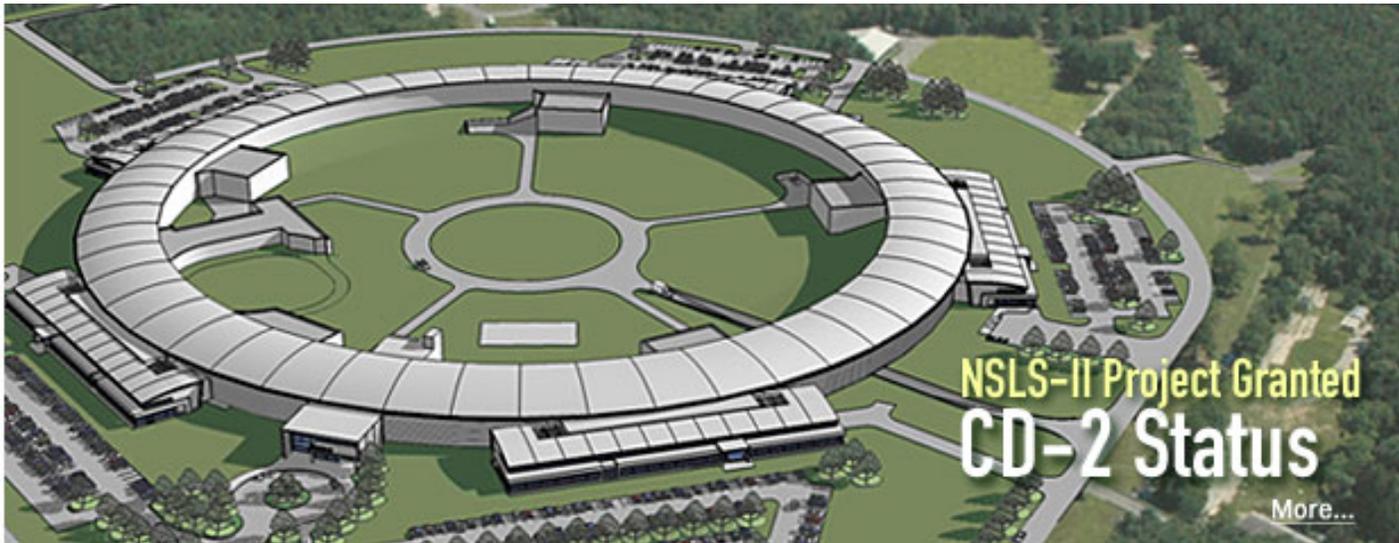
CFN is the 5<sup>th</sup> and final of the SC/BES Nanoscale Science Research Centers (NSRCs). The idea for the NSRCs was born at a meeting held at DOE HQ in March 1999.



## *And congratulations also to ...*

- **The National Synchrotron Light Source – II Project, which successfully completed CD-2 on January 18<sup>th</sup>, 2008.**

NSLS “upgrade” discussions predate my arrival in DOE in November 1995. However, the modern NSLS-II plan dates from about 6 years ago.



# Critical Decisions Really are Critical

Preconceptual Planning	Conceptual Design	Preliminary Design	Final Design	Construction	Operations
❖	❖	❖	❖	❖	❖
<b>CD-0</b>	<b>CD-1</b>	<b>CD-2</b>	<b>CD-3</b>	<b>CD-4</b>	
Approve Mission Need	Approve Alternative Selection & Cost Range	Approve Performance Baseline	Approve Start of Construction	Approve Start of Operations or Project Completion	

DOE O 413.3A (Updated 2/2/07)					
Preconceptual Planning	Conceptual Design	Preliminary Design	Final Design	Construction	Operations
CD-0	CD-1	CD-2	CD-3	CD-4	
Approve Mission Need	Approve Alternative Selection & Cost Range	Approve Performance Baseline	Approve Start of Construction	Approve Start of Operations or Project Completion	
<b>Actions Authorized by Critical Decision (CD) Approval</b>					
<b>CD-0</b>	<b>CD-1</b>	<b>CD-2</b>	<b>CD-3</b>	<b>CD-4</b>	
<ul style="list-style-type: none"> <li>Proceed with Conceptual Design</li> <li>Request PED funding</li> <li>Start monthly PARS &amp; Quarterly Project Performance reporting</li> </ul>	<ul style="list-style-type: none"> <li>Allow Expenditure of PED Funds for preliminary design</li> <li>Approval of long-lead procurement if necessary</li> </ul>	<ul style="list-style-type: none"> <li>Establish Performance Baseline</li> <li>Continue design</li> <li>Request construction funding</li> </ul>	<ul style="list-style-type: none"> <li>Approve expenditure of funds for construction</li> </ul>	<ul style="list-style-type: none"> <li>Allow start of operations or project completion</li> </ul>	
<b>Non-Nuclear Facilities--Prerequisite Activities for CDs</b>					
<ul style="list-style-type: none"> <li>Review of Mission Need Statement (MNS) by Office of Program Analysis &amp; Evaluation (CT-20) for \$100M or greater.</li> <li>Perform Mission Need Independent Project Review (IPR) for Major System (MS) projects (&gt;=\$750K)</li> <li>Perform Pre-conceptual Planning</li> <li>Evaluate Information Technology (IT) projects with Departmental Enterprise Architecture framework</li> </ul>	<ul style="list-style-type: none"> <li>Review of Acquisition Strategy (AS) (OECM review for MS projects)</li> <li>Review of Conceptual Design                             <ul style="list-style-type: none"> <li>Requirements Analysis</li> <li>Risk Analysis                                     <ul style="list-style-type: none"> <li>Alternative Analysis</li> <li>Value Management determination</li> </ul> </li> <li>Assess Requirements Analysis, Risk Analysis, Alternative Analysis, &amp; Value Management.</li> <li>Appoint FPD</li> <li>Establish &amp; charter Integrated Project Team</li> <li>Ensure compliance with One-for-One Replacement requirement for building square footage</li> <li>Ensure Integrated Safety Management Implementation</li> <li>Ensure consideration for High Performance Sustainable Building</li> <li>Assess if QA Program is acceptable</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Perform Baseline External Independent Review (EIR) &amp; validation by OECM for \$100M or greater.</li> <li>Perform Independent Cost Review or Independent Cost Estimates for MS project as part of EIR</li> <li>Program IPR for \$20M to less than \$100M</li> <li>Review of Preliminary Design</li> <li>Establish compliant project EVMS for \$20M or more, &amp; OECM certifiable EVMS for project TPC with \$50M or more</li> <li>Conduct Value Engineering (as applicable)</li> <li>Incorporate High Performance Sustainable Building provisions into design</li> <li>Determine if QA Program is acceptable</li> </ul>	<ul style="list-style-type: none"> <li>Perform Executability EIR by OECM for MS projects</li> <li>Perform IPR for Non-MS projects by Program (SC)</li> </ul>	<ul style="list-style-type: none"> <li>Verify Key Performance Parameter or Completion Criteria achieved</li> <li>Perform Readiness Assessment or Operational Readiness Review</li> <li>Revise environmental management system.</li> </ul>	
<b>Hazard Category 1, 2, and 3 Nuclear Facilities--Additional Prerequisite Activities/Documents for CDs</b>					
<ul style="list-style-type: none"> <li>Perform Technical IPR</li> <li>Prepare Conceptual Safety Design Report (SDR)</li> <li>Prepare a Preliminary Safety Validation Report (PSVR)</li> </ul>	<ul style="list-style-type: none"> <li>Prepare Preliminary SDR</li> <li>Prepare a PSVR based on updated design</li> </ul>	<ul style="list-style-type: none"> <li>Prepare Preliminary Documented Safety Analysis Report (SAR)</li> <li>Prepare SER</li> </ul>	<ul style="list-style-type: none"> <li>Prepare Documented SAR with Technical Safety Requirements</li> <li>Prepare SER</li> </ul>		
<b>Prerequisite Documents</b>					
<ul style="list-style-type: none"> <li>MNS</li> <li>Tailoring Strategy</li> </ul>	<ul style="list-style-type: none"> <li>Acquisition Strategy</li> <li>Conceptual Design Report</li> <li>Risk Management Plan</li> <li>Risk Assessment</li> <li>Preliminary PEP</li> <li>Preliminary Hazard Analysis (HA)</li> <li>Preliminary Security Vulnerability Assessment Report (SVAR)</li> <li>Initial Cyber Security Plan for IT projects</li> <li>QA Program Documentation</li> </ul>	<ul style="list-style-type: none"> <li>Performance Baseline</li> <li>Preliminary Design</li> <li>Updated Risk Assessment</li> <li>Updated PEP</li> <li>Updated HA (Approved at Field Level)</li> <li>Updated Preliminary SVAR</li> <li>NEPA Documentation</li> <li>Updated Initial Cyber Security Plan for IT projects</li> </ul>	<ul style="list-style-type: none"> <li>Final Design</li> <li>Updated CD-2 documents</li> <li>Updated QA Program</li> <li>An Approved Construction Project Safety &amp; Health Plan</li> <li>Updated Cyber Security Plan for IT projects</li> </ul>	<ul style="list-style-type: none"> <li>Checkout, Testing &amp; Commissioning Plan</li> <li>Project Transition/ Closeout Plan</li> <li>Transition-to-Operations Plan</li> <li>Finalized QA Plan, SVAR, HA Report, Construction Project Safety &amp; Health Plan, Finalized Cyber Security Plan for IT projects &amp; completed Certification &amp; Accreditation, as required</li> </ul>	
<b>Budget Related Documents</b>					
<ul style="list-style-type: none"> <li>After CD-0 approval, Exhibit 300 for Projects &gt;=\$20M: Annual submission initiated during the federal budget cycle when funds are requested.</li> <li>Project Data Sheets: Annual submission initiated during the federal budget cycle when TEC funds are requested.</li> </ul>					

## Authorized by Critical Decision (CD) Approval

CD-2	CD-3	CD-4
<ul style="list-style-type: none"> <li>Establish Performance Baseline</li> <li>Continue design</li> <li>Request construction funding</li> </ul>	<ul style="list-style-type: none"> <li>Approve expenditure of funds for construction</li> </ul>	<ul style="list-style-type: none"> <li>Allow start of operations or project completion</li> </ul>

## Facilities--Prerequisite Activities for CDs

<ul style="list-style-type: none"> <li>Perform Baseline External Independent Review (EIR) &amp; validation by OECM for \$100M or greater.</li> <li>Perform Independent Cost Review or Independent Cost Estimates for MS project as part of EIR</li> <li>Program IPR for \$20M to less than \$100M</li> <li>Review of Preliminary Design</li> <li>Establish compliant</li> </ul>	<ul style="list-style-type: none"> <li>Perform Executability EIR by OECM for MS projects</li> <li>Perform IPR for Non-MS projects by Program (SC)</li> </ul>	<ul style="list-style-type: none"> <li>Verify Key Performance Parameter or Completion Criteria achieved</li> <li>Perform Readiness Assessment or Operational Readiness Review</li> <li>Revise environmental management system.</li> </ul>
<b>Post CD-4 Closeout</b>		
<ul style="list-style-type: none"> <li>Perform Final Administrative &amp; Financial Closeout</li> </ul>		

# The Critical Decision Crib Sheet

OFFICE OF SCIENCE PROJECT MANAGEMENT DECISION/APPROVAL MATRIX (Updated 10/30/06)

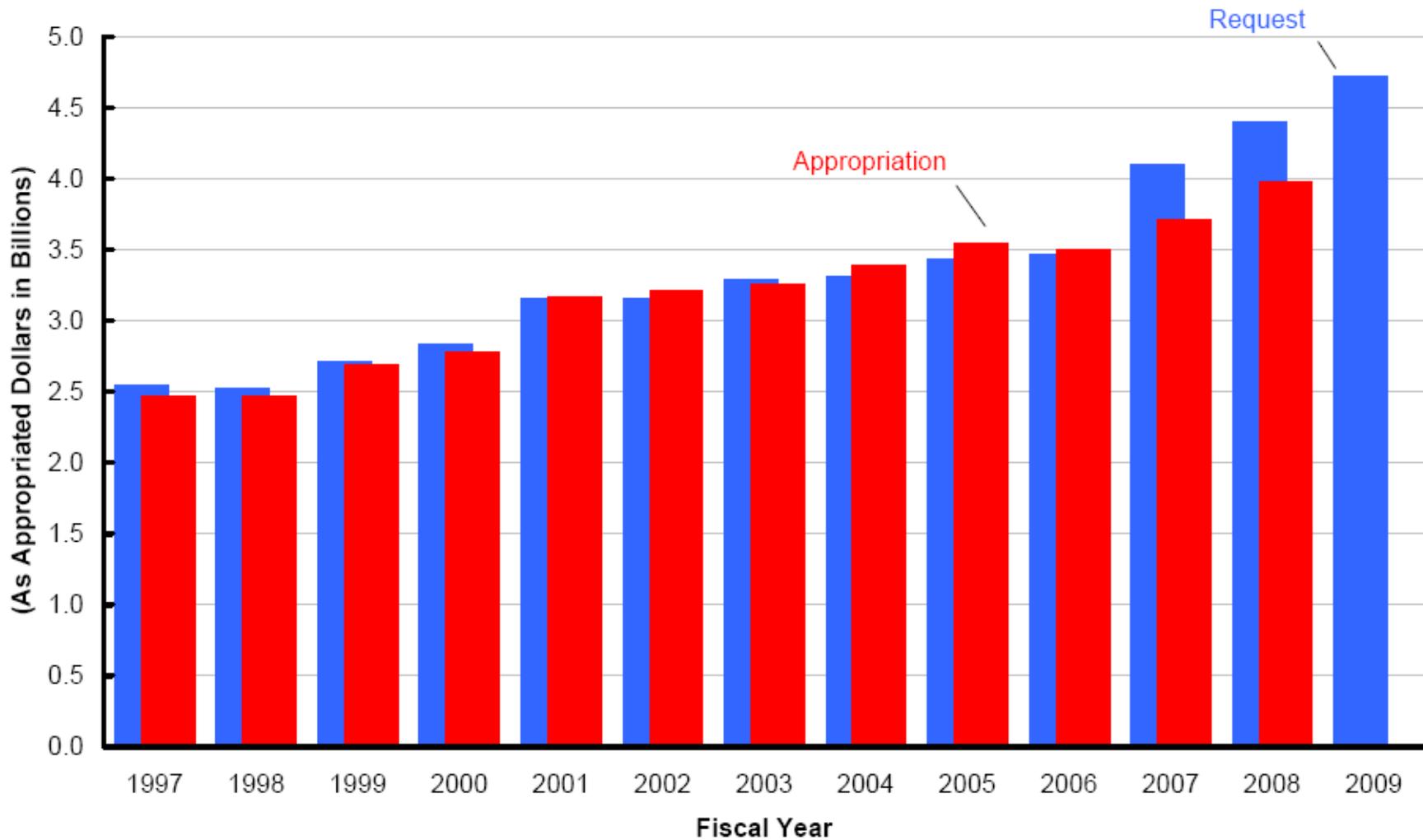
TOTAL PROJECT COST (TPC)		\$750M or more	Less than \$750M to \$400M	Less than \$400M to \$100M	Less than \$100M to \$20M	Less than \$20M to \$5M	
		Delegation Allowed to SC-1 for less than \$400M			Delegation Allowed		
DECISION/APPROVAL		Reviewed by PA&E Approved by SC-1	Reviewed by PA&E Approved by SC-1	Reviewed by PA&E Approved by SC-1	Reviewed by SC-1.3 Approved by SC-1	Reviewed by SC-1.3 Approved by SC-AD	
Prior to CD-0, Mission Need Statement		Reviewed by OECM Approved by SC-1	Reviewed by SC-1.3 Approved by SC-1	Reviewed by SC-1.3 Approved by SC-1	Reviewed by SC-1.3 Approved by SC-1	Reviewed by SC-1.3 Approved by SC-AD	
CRITICAL DECISIONS	CD-0 --Approve Mission Need	<b>NSLS-II</b>	US-SC	US-SC delegated to <b>SC-1</b>	SC-1	SC-AD	
	CD-1--Approve Alternative Selection and Cost Range		US-SC	US-SC delegated to <b>SC-1</b>	SC-1 delegated to <b>SC AD</b>	PM or SOM if delegated	
	CD-2 --Approve Performance Baseline		S-2	US-SC	US-SC delegated to <b>SC-1</b>	SC-1 <b>CFN</b> SC AD	PM or SOM if delegated
	CD-3 --Approve Start of Construction		S-2	US-SC	US-SC delegated to <b>SC-1</b>	SC-1 <b>CFN</b> SC AD	PM or SOM if delegated
	CD-4 --Approve Start of Operation or Project Completion		S-2	US-SC	US-SC delegated to <b>SC-1</b>	<b>SC-1 delegated to SC AD</b>	PM or SOM if delegated
BASELINE MANAGEMENT	Deviations	If performance, scope, schedule, or cost baseline at CD-2 cannot be met, then S-2 must be notified & a determination made to terminate the project or establish a new performance baseline.				N/A	
	New Performance Baseline Approval	S-2 approval is needed if cumulative change in Performance Baseline of >6 months or >\$25M or 25% of Original Cost Baseline at CD-2 or change in scope not meeting the mission need or not in conformance with the Project Execution Plan; or US-SC approval if preceding threshold is not exceeded; or PSO approval if delegated.				N/A	
	Directed Change	Project changes caused by DOE Policy Directive, Regulatory, or Statutory action such as changes in approved budget or requirements.					
	Routine Project Changes/Control	Program	SC-1	SC-1	SC-AD	SC AD	SC AD
	Project	PM, SOM or FPD (Optional)	PM, SOM or FPD (Optional)	PM, SOM or FPD (Optional)	PM, SOM or FPD (Optional)	PM, SOM or FPD (Optional)	
	Contractor	Contractor	Contractor	Contractor	Contractor	Contractor	
PEP --Project Execution Plan Approval		S-2	US-SC	US-SC delegated to <b>SC-1</b>	SC-1 delegated to <b>SC AD</b>	PM or SOM if delegated	
Site Selection		S-2	S-2	S-2	S-2	N/A	
REVIEWS	EIR --External Independent Review by OECM	Prior to CD-2 & CD-3	Prior to CD-2	Prior to CD-2	N/A	N/A	
	IPR--Independent Project Review by SC-1.3	Prior to CD-0 & CD--3	Prior to CD-3	Prior to CD-3	Prior to CD-2 & CD-3	Optional prior to CD-2 & CD-3	
	ORR/RA--Operational Readiness Review/Readiness Assessment by Program	Prior to CD-4	Prior to CD-4	Prior to CD-4	Prior to CD-4	Prior to CD-4	
	Design Review*	Prior to CD-1, CD-2, CD-3	Prior to CD-1, CD-2, CD-3	Prior to CD-1, CD-2, CD-3	Prior to CD-1, CD-2, CD-3	Optional	
	Technical IPR for Nuclear Facility**	Prior to CD-1	Prior to CD-1	Prior to CD-1	Prior to CD-1	Optional	
PARS Reporting (EVMS for Projects >\$20 M)		Monthly Project Status After CD-0 and Monthly Project Performance After CD-2				Monthly Project Status After CD-0	
QPPR --Quarterly Project Performance Review		Quarterly After CD-0 by SAE/AE				N/A	
FPD --Federal Project Director		Appointed by SAE at CD-1	Appointed by AE at CD-1				

AD=Associate Director; AE=Acquisition Executive; EIR=External Independent Review Conducted by OECM; FPD=Federal Project Director; IPR =Independent Project Review Conducted by SC; ORR=Operational Readiness Review Conducted by SC; PARS= Project Analysis and Reporting System; PM=HQ Office of Science Program Manager; S-2=Deputy Secretary; SAE=Secretarial Acquisition Executive; SC=Office of Science; SC-1=Director, Office of Science; SOM=Site Office Manager; US-SC=Under Secretary of Science; \*=Design Reviews by individuals external to the project.; \*\*=for high risk, hazard, and Category 1, 2, & 3 nuclear facilities only

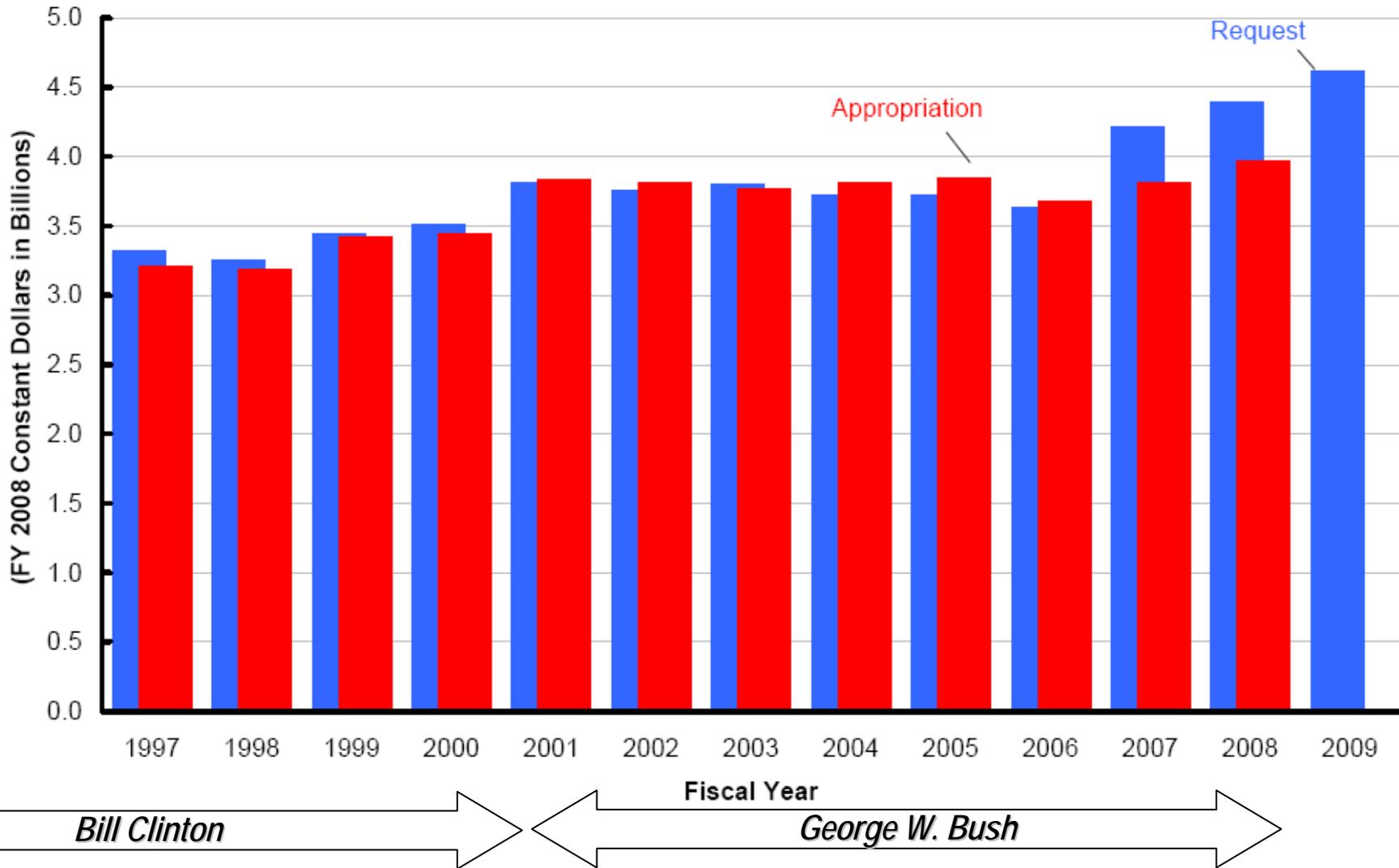
## *Science Funding – What the NAS Board on Physics and Astronomy Asked the Agencies Last Month*

1. How has the volatility in the appropriations process, combined with uncertainty in future budget planning, affected the programs? Irritant or serious impediment?
2. Should the Administration package initiatives (ACI, etc.) or support broad-based initiatives that address all of the physical sciences?
3. What are the most significant issues over the next year?
4. Where can the Academy add value?

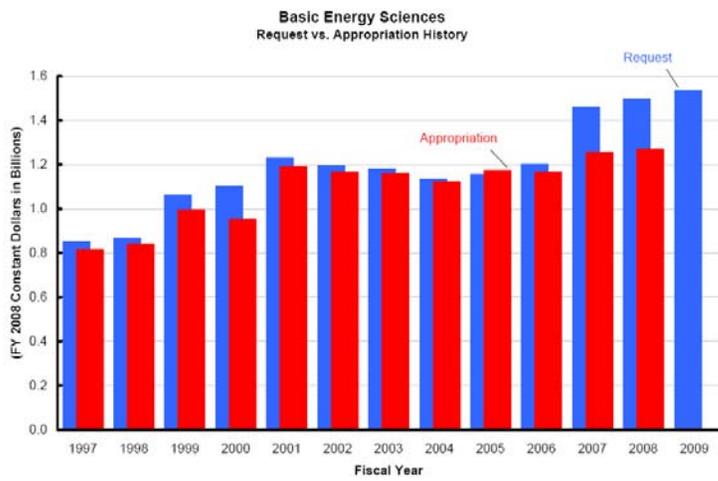
# SC Request vs. Appropriation History (As Appropriated \$s)



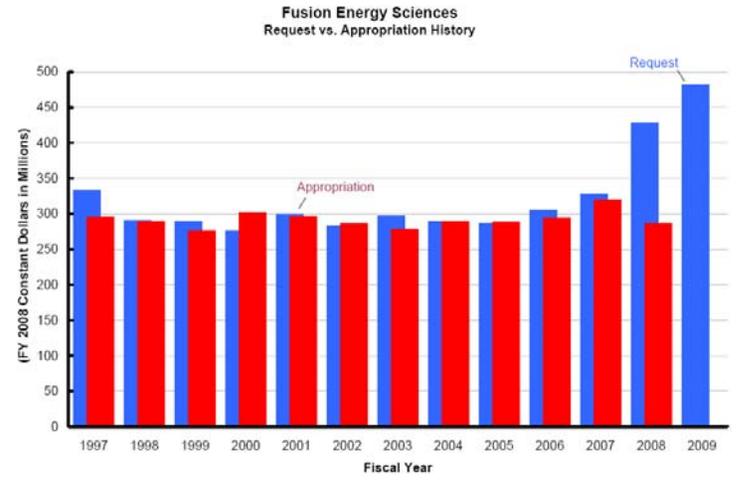
# SC Request vs. Appropriation History (Constant FY 2008 \$s)



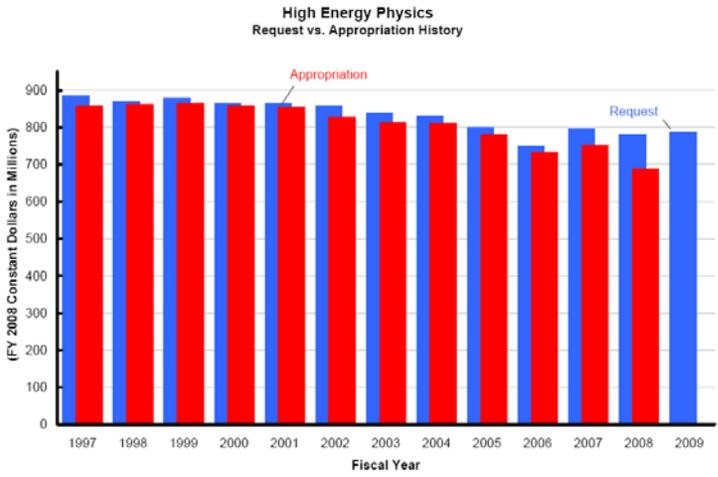
BES



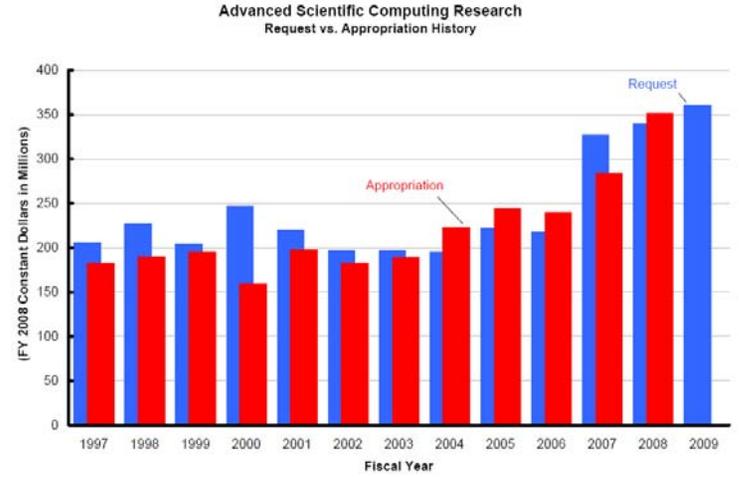
FES



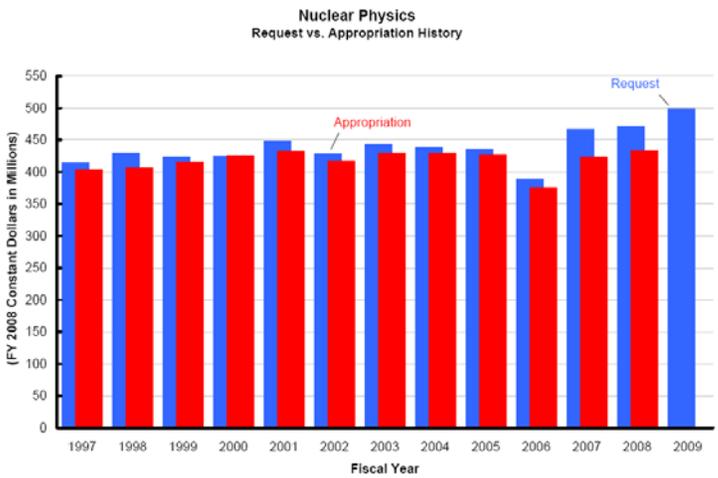
HEP



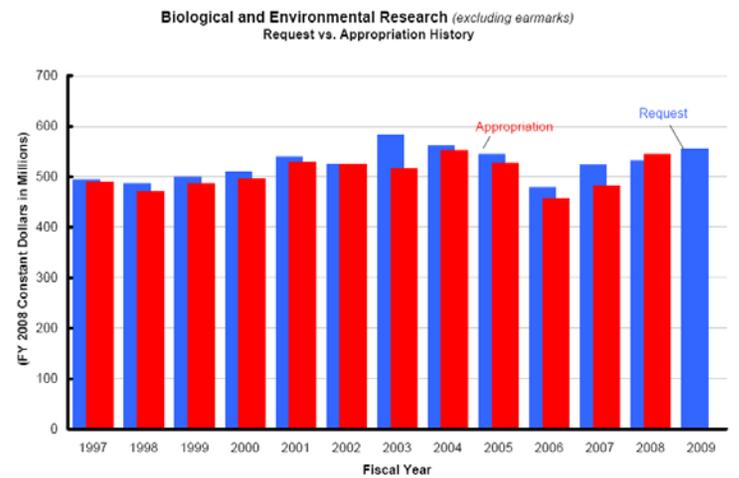
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## *Halfway Home ...*

- The National Synchrotron Light Source – II Project, which successfully completed CD-4 on ...

