

# DOE O 420.2D, *Safety of Accelerators* Implementation Plan

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## **What are the major changes in the revised directive?**

The applicability and intent have been clarified however, the overall approach to accelerator safety management has not changed. Additions to the Order include a new set of pre-approved exemptions and equivalencies, tailored requirements for low powered accelerators that were previously exempt or undefined, updated approval authorities, updated definitions, and a requirement for the Unreviewed Safety Issue (USI) process to be approved by DOE. Vague and ambiguous language has been removed throughout the Order and Contractor Requirements Document (CRD). A clear boundary has been established for regulation of activities under the Order. Exemptions and equivalencies not listed in the Order must be processed in accordance with DOE O 251.1D, Departmental Directives Program, Appendix E, Equivalency and Exemption Process. The CRD was revised to reflect the changes made to the Order, as applicable. SC-4 will revise the relevant Office of Science Management System (SCMS) procedures to reflect the changes in the Order.

## **How was the Implementation Plan developed?**

There was continuous stakeholder engagement throughout the revision process. A separate contractor sub-team was formed to provide feedback to the Integrated Project Team (IPT) on proposed changes. Proposed changes to the Order were discussed and debated during several sessions at the 2021 Accelerator Safety Workshop. The revised Order has been thoroughly socialized throughout the accelerator safety community during the monthly large group videoconference calls.

As part of the Order revision process the IPT drafted a high-level implementation strategy with specific actions for effectively communicating and implementing the revised requirements. The Office of Primary Interest (OPI), SC-4, solicited feedback on the plan from affected Site Office Managers through direct engagement of site office leadership reinforced by participation in DDFO hosted discussions. Feedback was also included from affected Programs Offices, the Accelerator Safety Community of Practice, and the National Laboratory Directors Council (NLDC). The 2022 DOE Accelerator Safety Workshop provided a valuable platform for open discussion with federal and contractor individuals who will be responsible for implementing the new requirements at their respective sites. The plan includes a set of implementation FAQs based on stakeholder feedback. The plan and FAQs will be updated as needed based on experience, observations, results, and additional feedback received.

## **How does the OPI plan to implement the revised directive?**

The Order has been promulgating to Federal staff and applicable contracts via the normal communication channels in the Departmental Directives Program. The cognizant contracting officer is responsible for incorporating the CRD into the contracts of affected contractors.

## **Additional Communication Efforts**

The Order and this plan will be shared with the accelerator community via the normal communication channels. Both documents are available on the Accelerator Safety Community Information Hub SharePoint Site. Additionally, SC-41 will request the Plan and FAQs be posted on the DOE Directives Website and DOE OPEXShare database.

To ensure there is a clear understanding of the revised Order, the OPI will engage with affected Site Offices and Labs to provide ongoing interactions and discussions via phone calls, email, and site assist visits to answer questions, and provide guidance. The OPI will work with federal and contractor staff at affected sites to verify implementation over the next 12 months via a series of accelerator safety program review assist visits. The DOE Office of Enterprise Assessment (EA) has indicated interest in conducting a series of independent implementation reviews as early as 12 months following issuance of the revised Order.

Implementation feedback will continue to be collected from the accelerator safety community during the monthly accelerator safety large group call. Relevant items will be documented for consideration in the revision of the associated Guide. Post implementation, a high-level document with a list of pre-approved exemptions and equivalencies will be collected by the Site Offices and maintained by the OPI for SC-1.

**Timeline for Implementation**

As an SC goal, Requirements for Federal employees should be implemented within 7 months of issuance. Although sites may vary, contractor activities to meet requirements should target accomplished within 9 months of issuance, if possible. It should be recognized that any operation currently covered under 420.2C and not covered under 420.2D will need a regulatory basis (or approved transition plan) for continued operation after 420.2D is implemented at the site.

**Suggested key steps for Site Office/Site use and consideration in local implementation plans**

Provide a current listing/inventory of accelerators managed under this Order and exemptions or equivalencies to this Order. (Denote basis for exemption/equivalency)
Review cited use of exemptions or equivalencies to this Order to ensure each is operating under the terms required to use the exemption/equivalency (i.e., assess compliance with ANSI/HPS N43.3-2008, ANSI/HPS N43.2-2021, ANSI/HPS N43.5-2005, NCRP Report 72-1983, or ANSI-HPS N43.1-2011)
Establish a periodic onsite validation process to ensure accelerators and devices granted exemptions or equivalencies provided in section 1. of the CRD continue to be operated under the conditions of the approved exemption or equivalency.
Establish program elements in section 2.a. of the CRD for all accelerators managed under the CRD.
Establish program elements in section 2.b. of the CRD for all accelerators managed under the CRD that operate above 10 MeV.
Update the Contractor Assurance System to include processes to review the contractor accelerator safety program elements listed in this CRD.
Submit accelerator safety documentation requiring DOE approval as established in the CRD.
Approve accelerator safety documentation as established in the Order.
Conduct assist visits and provide implementation guidance.
Create and maintain a high-level document with a list of pre-approved exemptions and equivalencies.
Complete update of accelerator safety documentation as appropriate.

A detailed table of implementation milestones and target completion dates is provided as a reference in Appendix A.

## Implementation FAQs

### Applicability and Other General Questions

- 1) **How long can a site continue to operate under 420.2C?** Each site will develop an implementation plan in accordance with CO direction and site practice. Generally, up to 1 year is afforded for new order implementation. It is SC's goal to implement in less than 1 year.
- 2) **What if I have replaced parts of a commercial sourced accelerator over time with parts not from the manufacturer or fabricated onsite?** If unable to demonstrate that each part meets OEM standards (safety, performance, etc.) then it is considered modified.
- 3) **Is the CRD required to be included in the contract if a site only operates accelerators under an approved equivalency?** Yes, the CRD is still included as the contractual vehicle for the equivalency and any remaining applicable requirements. The CRD can be appropriately tailored with approval from the DOE site manager.
- 4) **Is there a de minimis amount of special nuclear material that could be used in an accelerator and the order still applies?** The Order does not define a de minimis level for special nuclear material (SNM). Any quantity of SNM inside an accelerator will be subject to the same regulations that would apply outside of an accelerator, in addition to any applicable ASO requirements, unless superseded by an authorized alternative standard.

### Equivalencies and Exemptions

- 5) **Do I have to meet and be able to demonstrate all the requirements in the cited equivalency to use it?** Yes, and expect compliance reviews to address equivalencies
- 6) **Is there a common format to document listed equivalencies?** A common format may be considered by the team developing the new guide, however in the interim use of an equivalency must denote what equivalency has been invoked.
- 7) **What support is available to review equivalencies?** It is recognized that DOE site offices may not have access to the cited sources that are invoked upon use of the equivalencies. Site offices may request support directly from SC-41.
- 8) **Can a site use the Lab's Rad Protection and ISM Programs in place of the equivalencies in the Order?** Yes, provided the Site Office can confirm the existence of an appropriate crosswalk of the referenced institutional programs with requirements in 2.a through 2.c of the CRD for accelerators operated below 10 MeV.
- 9) **Which requirements of the CRD will the contractor need to meet for devices that fall under the 1.c Equivalency paragraph of the CRD?** The requirements in sections 1, 1.d, 2.a, 2.c, and 2.h of the CRD apply to all accelerators that meet the definition in attachment 2, regardless of their 1.c equivalency status. Accelerators that qualify for one of the pre-approved equivalencies in section 1.c should also qualify for relief from the requirements in sections 2.b through 2.g based on the range of energies in the referenced standards but, this qualification does not by itself relieve the contractor from meeting the remaining requirements of the CRD (see first sentence).
- 10) **Is the expectation that in order for a < 10 MeV accelerator to be excluded from the requirements in 4.c, it must also be managed to an equivalency mentioned in 3.c.(3) and/or be operated using commercially available manufacturer documentation?** No, the requirements in 4.c are not applicable to accelerators that operate < 10 MeV. This is not contingent on meeting an exemption/equivalency in 3.c.(3). Note that requests for exemptions and equivalencies to the requirements of the Order which are not addressed in section 3.c. must be processed in accordance with DOE O 251.1, Departmental Directives Program, current version.

## Documentation and Processes

- 11) **What is required in a USI process to be DOE approved?** Each site should work with its site office to discuss expectations. Beyond the aspects stated in the Order, sites should consider a low enough bar for review to ensure both individual and cumulative changes are well managed. Per the Order, DOE must approve a specific version to be in use.
- 12) **Does a site need to list every RGD managed under the ASO individually in the accelerator safety documentation or can an existing inventory list be referenced?** No, an existing inventory may be referenced provided it is accurate and up to date.

# Appendix A

## Suggested Implementation Milestones

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The table below contains suggested milestones and target completion dates.

Task		Target Date	Status	Notes
Final Approval	Deputy Sec	Sept 9, 2022	Complete	
Revised Order posted on DOE Directives website.	IPT Lead	Sept 12, 2022	Complete	
Incorporate CRD into affected contracts.	Cognizant CO	30 Days after issuance of Order per DEAR guidance		The contractor can assess the effect of incorporating the CRD and propose a timeline for full compliance. The FEM must concur on the proposed timeline.
Provide a platform for additional discussion about implementation at the 2022 Accelerator Safety Workshop.	OPI, IPT lead	Oct 18-20, 2022	Complete	SC-4 hosted the workshop at DOE HQ Germantown.
Develop strategy to prepare Sites for planned EA implementation review.	OPI	Dec 31, 2022	Ongoing	Finalize the implementation plan. Identify sites to Conduct assist visits and Accelerator Safety Program Reviews. Work with EA to gain insight about assessment criteria. Develop Lines of Inquiry (LOIs) for planned program assessments.
Develop site/facility specific implementation plan.	Contractor	Dec 31, 2022		
Conduct assist visits and provide implementation guidance.	OPI	Starting in Jan 2023		Sites and dates TBD based on OPI assessment and site office/site feedback and request. Assist teams will be comprised of federal and contractor staff from HQ and the field. SMEs will be selected from the Accelerator Safety COP.
Establish a periodic onsite validation process to ensure accelerators and devices granted exemptions or equivalencies provided in section 1. of the CRD continue to be operated under the conditions of	Contractor	March 1, 2023		The FEM must ensure accelerators and devices granted exemptions or equivalencies provided in section 3.c. of this Order continue to be operated under the conditions of the approved exemption or equivalency.

the approved exemption or equivalency.				
Provide a current listing/inventory of accelerators managed under this Order and exemptions or equivalencies to this Order.	Contractor	March 1, 2023		The FEM must review the listing/inventory of accelerators managed under this Order for appropriateness.
Establish program elements in section 2.a. of the CRD for all accelerators managed under the CRD.	Contractor	March 1, 2023		
Establish program elements in section 2.b. of the CRD for all accelerators managed under the CRD that operate above 10 MeV.	Contractor	April 1, 2023		
Update the Contractor Assurance System to include processes to review the contractor accelerator safety program elements listed in this CRD.	Contractor	April 1, 2023		The FEM must ensure the Contractor Assurance System includes processes for the review of contractor accelerator safety program elements as specified in the CRD.
Complete update of accelerator safety documentation as appropriate.	Contractor	April 1, 2023		Confirm that 420.2C compliant safety basis documentation still in use, meets the requirements of 420.2D.
Submit accelerator safety documentation requiring DOE approval as established in the CRD.	Contractor	April 1, 2023		
Approve accelerator safety documentation as established in the Order.	FEM	April 30, 2023		
Conduct targeted Accelerator Safety Program Reviews to verify implementation.	OPI/FEM	3rd,4th Qtr. OPI reviewed Sites and Dates TBD.		Reviews can be led by the site office with assistance from the OPI. Review teams will be comprised of federal and contractor staff from HQ and the field. SMEs will be selected from the Accelerator Safety COP.
Create and maintain a high-level document with a list of pre-approved	OPI	Sept 15, 2023		

exemptions and equivalencies.				
All sites fully compliant.	Contractor, FEM	Sept 30, 2023		Federal staff at affected sites will be required to verify implementation for compliance.