Consolidated Technical Analysis

The following table provides a list of 10 CFR Part 35 regulations and conditions the NRC has determined are applicable for use of Alpha DaRT. Licensees shall comply with all regulations which address use of Alpha DaRT. The table also provides specific conditions which the NRC has determined are necessary for the medical use of Alpha DaRT. In addition, the table lists where licensees and applicants can find additional guidance. Applicants may submit alternative list of regulations and specific conditions to be reviewed on a case-by-case basis by NRC staff.

Section	Description	Use Addressed in Regulation	Guidance	Alpha DaRT Guidance Section	Comment
<u>35.1</u>	Purpose and scope	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.2</u>	Definitions	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.5</u>	Maintenance of records	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.6</u>	Provisions for the	⊠Yes □No	⊠1566 Vol 9		
	protection of human	□N/A	□Alpha DaRT		
	research subjects		□Other		
<u>35.7</u>	FDA, other Federal, and	⊠Yes □No	⊠1566 Vol 9		
	State requirements	□N/A	□Alpha DaRT		
			□Other		
<u>35.8</u>	Information collection	⊠Yes □No	⊠1566 Vol 9		
	requirements: OMB	□N/A	⊠Alpha DaRT		
	approval		□Other		

<u>35.10</u>	Implementation	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.11</u>	License required	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
35.12	Application for license,	⊠Yes □No	⊠1566 Vol 9		
	amendment, or renewal	□N/A	□Alpha DaRT		
			□Other		
<u>35.13</u>	License amendments	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.14</u>	Notifications	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.15</u>	Exemptions regarding	⊠Yes □No	⊠1566 Vol 9		
	Type A specific licenses	□N/A	☐ Alpha DaRT		
	of broad scope		□Other		
<u>35.18</u>	License issuance	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
<u>35.19</u>	Specific exemptions	⊠Yes □No	⊠1566 Vol 9		
		□N/A	□Alpha DaRT		
			□Other		
Subpart E	3 – General Administrative R	Requirements			
35.24	Authority and	⊠Yes □No	⊠1566 Vol 9		
	responsibilities for the	□N/A	□Alpha DaRT		
	radiation protection		□Other		
35.26	program Radiation protection	□Yes ⊠No	⊠1566 Vol 9	6.9	The Alpha DaRT licensing guidance maybe
<u> </u>	program changes	□ Yes ⊠No	⊠ Alpha DaRT	0.9	revised as the industry gains more
	F 3. s ss	LIN/A	□Other		experience more about the technology.
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35.27	Supervision	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT		Licensees should be authorized to make radiation protection program changes to follow future revisions of the guidance. Licensees need to evaluate all aspects of its radiation safety program when adding a new use and make commensurate changes, i.e., area surveys, emergency procedures, radiation safety training, etc.
			□Other		
35.40	Written directives (WDs)	⊠Yes □No □N/A	⊠1566 Vol 9 ⊠Alpha DaRT □Other	7.2	While a new requirement is not necessary, total source strength recorded on the written directive need to only include the Ra-224 activity.
35.41	Procedures for administrations requiring a WD	⊠Yes ⊠No □N/A	⊠1566 Vol 9 ⊠Alpha DaRT □Other	6.1	Requirements in 10 CFR 35.41 can be followed but additional commitments are needed. Due to the potential for leakage outside the patient's body, licensees need to commit to verify that seeds are fully contained without leakage outside the patient's body after administration. In addition, as seeds could be dislodged, licensees shall commit to evaluating the location of the seeds prior to removal for temporary implant brachytherapy to determine if the seeds moved during treatment to determine if a medical event occurred.
35.49	Suppliers for sealed sources or devices for medical use	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.50	Training for Radiation Safety Officer (RSO) and Associate RSO	⊠Yes □No □N/A	⊠1566 Vol 9 ⊠Alpha DaRT	5.2.2	While a new condition is not necessary, the guidance reminds licensees of the requirement in 10 CFR 35.50(d) which

			□Other		requires RSOs to have training in the radiation safety, regulatory issues, and emergency procedures for the types of use for which a licensee seeks approval
35.51	Training for an authorized	□Yes □No ⊠	□1566 Vol 9		Use of Alpha DaRT does not require AMP.
	medical physicist (AMP)	N/A	□Alpha DaRT		
			□Other		
<u>35.55</u>	Training for an authorized	□Yes □No ⊠	□1566 Vol 9		Use of AlphaDaRT does not require ANP.
	nuclear pharmacist	N/A	□Alpha DaRT		
	(ANP)		□Other		
35.57	Training for experienced	⊠Yes □No □	⊠1566 Vol 9		
	RSO, teletherapy or	N/A	□Alpha DaRT		
	medical physicist, AMP,		□Other		
	authorized user, nuclear pharmacist, and ANP				
35.59	Recentness of training	⊠Yes □No	⊠1566 Vol 9		
00.00	Trecentiness of training		□Alpha DaRT		
		□N/A	□Other		
Subpart (l C – General Technical Requi	rements			
35.60	Possession, use, and	□Yes ⊠No □	⊠1566 Vol 9		As licensees are not required to determine
00.00	calibration of instruments	N/A	□Alpha DaRT		dosages in accordance with 10 CFR 35.63,
	used to measure the	14/7	□Other		no additional condition is necessary here.
	activity of unsealed				Calibration is described further in the table
	byproduct material				under 10 CFR 35.432.
<u>35.61</u>	Calibration of survey	⊠Yes □No	⊠1566 Vol 9		
	instruments	□N/A	□Alpha DaRT		
			□Other		
<u>35.63</u>	Determination of dosages	□Yes ⊠No □	□1566 Vol 9	6.7	As Alpha DaRT is a brachytherapy device,
	of unsealed byproduct	N/A	⊠Alpha DaRT		licensees do not need to comply with
	material for medical use		□Other		10 CFR 35.63.
<u>35.65</u>	Authorization for	⊠Yes □No □	⊠1566 Vol 9		
	calibration, transmission,	N/A	□Alpha DaRT		
	and reference sources		□Other		

35.67	Requirements for possession of sealed sources and brachytherapy sources	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
<u>35.69</u>	Labeling of vials and syringes	□Yes ⊠No □N/A	□1566 Vol 9 □Alpha DaRT □Other	6.4	Alpha DaRT is not a radioactive drug and does not require labeling per 10 CFR 35.69 is not required. Licensees shall commit to label applicators in accordance with the sealed source and device registry.
<u>35.70</u>	Surveys of ambient radiation exposure rate	□Yes ⊠No □N/A	□1566 Vol 9 ⊠Alpha DaRT □Other	6.5	As Alpha DaRT has a higher potential for contamination, licensees shall commit to performing surveys after every administration, not just once per day. Both ambient radiation and contamination surveys should be performed.
<u>35.75</u>	Release of individuals containing unsealed byproduct material or implants containing byproduct material	⊠Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other	7.3	While there are no additional commitments, the guidance gives additional radiation safety items licensees should consider to ensure patient release limits are not exceeded. See Regulatory Guide 8.39, "Release of Patients Administered Radioactive Materials." for more guidance.
35.80	Provision of mobile medical service	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
	Decay-in-storage	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT ⊠Other		
	– Manual Brachytherapy				
35.400	Use of sources for manual brachytherapy	□Yes ⊠No □N/A	⊠1566 Vol 9 ⊠Alpha DaRT □Other	7.4	While there are no additional commitments, additional guidance is given to use the applicators as listed in the Sealed Source and Device registry as the applicators are specific to radiation safety.

<u>35.404</u> <u>35.406</u> <u>35.410</u>	Surveys after source implant and removal Brachytherapy sources accountability Safety instruction	⊠Yes □No□N/A⊠Yes □No□N/A⊠Yes □No□N/A	□ 1566 Vol 9 □ Alpha DaRT □ Other □ 1566 Vol 9 ☑ Alpha DaRT □ Other □ 1566 Vol 9 □ Alpha DaRT	7.5	While there is no additional commitments, additional guidance is given on how licensees can maintain accountability and document the location of use.
<u>35.415</u>	Safety precautions	□Yes ⊠No □N/A	□Other ⊠1566 Vol 9 ⊠Alpha DaRT □Other	6.8	In addition to the commitments in 10 CFR 35.415, use of sealed container is necessary for all waste and unsealed sources to control contamination.
35.432	Calibration measurements of brachytherapy sources	□Yes ⊠No □N/A	⊠1566 Vol 9 ⊠Alpha DaRT □Other	6.7	As permitted by 10 CFR 35.432, it is expected that licensees will use measurements provided by the source manufacturer instead of making their own calibration measurements. However, as there is a potential that the applicator could leak, licensees shall commit to ensure the integrity of the applicator seal prior to administering seeds to a patient in addition to following 10 CFR 35.432.
35.433	Sr-90 sources for ophthalmic treatments	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
35.457	Therapy-related computer systems	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.490	Training for use of manual brachytherapy sources	□Yes ⊠No □N/A	□1566 Vol 9 ⊠Alpha DaRT □Other	5.2	Similar to 10 CFR 35.490 but specific for Alpha DaRT.

<u>35.491</u>	Training for ophthalmic use of Sr-90	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
Subpart L	Records				
35.2024	Records of authority and responsibilities for radiation protection programs	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.2026	Records of radiation protection program changes	□Yes ⊠No □N/A	□1566 Vol 9 ⊠Alpha DaRT □Other	6.9	Records of radiation protection program changes made per the commitment which replaced 10 CFR 35.26 must be kept for 5 years similar to the requirements in 10 CFR 35.2026.
35.2040	Records of WDs	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.2041	Records for procedure for administrations requiring a WD	□Yes ⊠No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other	6.1	As a commitment for additional procedures for administration is necessary, licensees must commit to maintain a record of these procedures for the duration of the license similar to the requirement in 10 CFR 35.2041.
35.2060	Records of calibrations of instruments used to measure the activity of unsealed byproduct materials	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.2061	Records of radiation survey instrument calibrations	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.2063	Records of dosages of unsealed byproduct material for medical use	□Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other		As 10 CFR 35.63 is not required, these records are not applicable for Alpha DaRT.

<u>35.2067</u> <u>35.2070</u>	Records of leaks tests and inventory of sealed sources and brachytherapy sources Records of surveys for ambient radiation exposure rate	⊠Yes □No □N/A □Yes ⊠No □N/A	□ 1566 Vol 9 □ Alpha DaRT □ Other □ 1566 Vol 9 □ Alpha DaRT □ Other	6.5	In addition to 10 CFR 35.2070, licensees should also keep a record in a similar manner as 10 CFR 35.2070 of surveys after each administration.
35.2075	Records of the release of individuals containing unsealed byproduct material or implants containing byproduct material	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other	7.3	See Regulatory Guide 8.39, "Release of Patients Administered Radioactive Materials." for more guidance.
35.2080	Records of mobile medical services	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
35.2092	Records of decay-in- storage	⊠Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other		
35.2204	Records of Mo-99, Sr-82, and Sr-85 concentrations	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
35.2404	Records of surveys after source implant and removal	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.2406	Records of brachytherapy source accountability	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other	7.5	While there is no additional commitments, additional guidance is given on how licensees can maintain accountability and document the location of use.

35.2432	Records of calibration measurements of brachytherapy sources	⊠Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other	6.7	
35.2433	Records of decay of Sr- 90 sources for ophthalmic treatments	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
Subpart N	И – Reports				
35.3045	Report and notification of a medical event	□Yes ⊠No □N/A	□1566 Vol 9 □Alpha DaRT □Other	6.2	As Alpha DaRT seeds are unsealed brachytherapy sources, not all medical event criteria listed in 10 CFR 35.3045 is applicable. Therefore, use of Alpha DaRT needs unique medical event reporting criteria such as that described in the Alpha DaRT guidance.
35.3047	Report and notification of a dose to an embryo/fetus or a nursing child	⊠Yes □No □N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.3067	Report of a leaking source	□Yes □No ⊠ N/A	⊠1566 Vol 9 □Alpha DaRT □Other		
35.3204	Report and notification for an eluate exceeding permissible Mo-99, Sr- 82, and Sr-85 concentrations	□Yes □No ⊠ N/A	□1566 Vol 9 □Alpha DaRT □Other		
Subpart N	N – Enforcement				
35.4001	Violations	⊠Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other		
35.4002	Criminal penalties	⊠Yes □No □N/A	□1566 Vol 9 □Alpha DaRT □Other		

Additional Considerations	
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