Clear Form

ACCELERATOR CHECKLIST

(A FACILITY form is not required when completing this form)

Facility_____ Date Surveyed _____

Registration Number_____-_____ Control number _____ Inspector _____

Certified Registration Number_____

Facility E-mail Address _____ Person Interviewed_____

Control Panel Manufacturer and Serial No._____

Choose Y *for yes (compliant),* N *for no (noncompliant) and* N/A *for not applicable.* *(All reg references preceded by 0400-20-)*

General Requirements **[Questions 1 – 46]**

☐ Unit is in storage and not being used.

	Y	N	N/A	
1.	◯	◯	◯	Certified Registration present. (04-.11(1)(c))
2.	◯	◯	◯	Regulations present. (04-.11(1)(a))
3.	◯	◯	◯	"Notice To Employees" [RHS 8-3] posted. (04-.11(1)(g))
4.	◯	◯	◯	Switch at control panel "CAUTION-RADIATION, THIS EQUIPMENT PRODUCES RADIATION WHEN ENERGIZED". (05-.111(11))
5.	◯	◯	◯	Entrance to room posted with "GRAVE DANGER, VERY HIGH RADIATION AREA", or "DANGER, HIGH RADIATION AREA", or "CAUTION, HIGH RADIATION AREA", whichever is applicable. (05-.111(1), (2) and (3))
6.	◯	◯	◯	Personnel monitoring provided to detect energies and radiation produced by the accelerator. (05-.70, 05-.71, 09-.17(2))
7.	◯	◯	◯	Personnel monitoring records maintained. (05-.135)
8.	◯	◯	◯	Occupational dose limits maintained as required under 0400-20-05-.50 and 0400-20-05-.56.
9.	◯	◯	◯	Has a survey been performed to determine that the unrestricted area dose limits are met and records maintained of this determination? (05-.61, 09-.17(3), and 05-.136)
10.	◯	◯	◯	Accelerator can only be activated from control panel. (09-.17(4)(a))
11.	◯	◯	◯	All entrances into a target room or other high radiation areas provided with interlocks. (09-.17(4)(b))
12.	◯	◯	◯	The interlock system and emergency cut-off on separate electrical circuits and/or mechanical systems. (09-.17(4)(c))
13.	◯	◯	◯	Breaking interlock terminates beam. (09-.17(4)(d))
14.	◯	◯	◯	Radiation production only from control panel after interlock break. (09-.17(4)(d))
15.	◯	◯	◯	Interlocks never used to shut off the accelerator except in an emergency or during testing. (09-.17(4)(e))
16.	◯	◯	◯	Emergency shut-off switches available and located within the accelerator room. (09-.17(4)(f))

17. ◯ ◯ ◯ Emergency shut-off switches identified by conspicuous sign posted adjacent to the switch. (09-.17(4)(f))

18. ◯ ◯ ◯ Emergency shut-off switches mode of operation (e.g., "PUSH") identified by conspicuously posted sign. (09-.17(4)(f))

19. ◯ ◯ ◯ Engaging emergency shut-off switches terminates beam. (09-.17(4)(f))

20. ◯ ◯ ◯ Emergency shut-off switches each have manual reset at each switch. (09-.17(4)(f))

21. ◯ ◯ ◯ After manual reset of the emergency shut-off switch, radiation can only be produced at the control panel. (09-.17(4)(f))

22. ◯ ◯ ◯ All meters and controls on the accelerator control console identifiable and discernible. (09-.17(4)(i))

23. ◯ ◯ ◯ Control panel provided with locking device when not in use. (09-.17(4)(j))

24. ◯ ◯ ◯ Portable survey equipment available. (09-.17(4)(k))

25. ◯ ◯ ◯ Portable survey equipment tested daily for operation. (09-.17(4)(k))

26. ◯ ◯ ◯ Portable survey equipment calibrated quarterly. (09-.17(4)(k))

27. ◯ ◯ ◯ Note attached to each portable survey meter showing latest calibration. (09-.17(4)(k))

28. ◯ ◯ ◯ Records of portable survey meter calibrations maintained. (09-.17(4)(k))

29. ◯ ◯ ◯ There shall be present at the control panel and at all entrances to all high radiation areas a device which shall give a continuous indication of the radiation levels present in the target area or areas. (09-.17(4)(l))

30. ◯ ◯ ◯ Electrical circuit diagrams of the accelerator and the associated interlock system shall be kept current and on file at each accelerator facility. (09-.17(4)(m))

31. ◯ ◯ ◯ All high radiation areas so constructed that persons within the area may at all times be able to escape. (09-.17(4)(n))

32. ◯ ◯ ◯ Only qualified operators of the accelerator shall be allowed to unlock and operate the accelerator. (09-.17(5)(a))

33. ◯ ◯ ◯ When interlocks bypassed for testing or maintenance, there is conspicuous indication at the control panel that the interlocks are being bypassed. (09-.17(5)(b))

34. ◯ ◯ ◯ Accelerator never used for routine use while interlocks are bypassed. (09-.17(5)(b))

35. ◯ ◯ ◯ Are activities in which interlocks are bypassed as permitted under 0400-20-09-.17(5)(b) conducted as required by 0400-20-09-.17(5)(c)?

36. ◯ ◯ ◯ If interlocks are bypassed as permitted in 0400-20-09-.17(5)(b), are individuals entering the accelerator room required to have audible indicating personnel monitoring equipment? (09-.17(5)(d))

37. ◯ ◯ ◯ Is the audible personnel monitoring equipment referred to in the above question (#35) set at trigger level of minimal 15 mR/hr? (09-.17(5)(d))

38. ◯ ◯ ◯ Is the audible personnel monitoring equipment referred to in the above question (#35) calibrated quarterly? (09-.17(5)(d))

39. ◯ ◯ ◯ Operating procedures available at the control panel. (09-.17(5)(e))

40. ◯ ◯ ◯ Emergency procedures available at the control panel. (09-.17(5)(e))

41. ◯ ◯ ◯ All safety and warning devices tested quarterly. (09-.20(1))

42. ◯ ◯ ◯ Records maintained of these quarterly tests. (09-.16)

43. ◯ ◯ ◯ After any interlock has been bypassed or otherwise prevented from operation (for reason other than testing), when such interlock is returned to use, is it tested to determine if the interlock is functioning properly? (09-.20(3))

44. ◯ ◯ ◯ Records maintained of this test referred to in question 43. (09-.16)

45. ◯ ◯ ◯ After radiation production of accelerator, entry into the accelerator room by personnel is made with survey meter. (09-.20(4))

46. ◯ ◯ ◯ All conditions of use from the Certified Registration met. (09-.08(3))

Human Use Requirements (9-.21) [Questions 47 – 65]

47. ◯ ◯ ◯ No individual except the patient in the treatment room during radiation. (09-.21(1)(a))

48. ◯ ◯ ◯ During patient irradiation, both the patient and the control panel are at all times kept under observation by the operator. (09-.21(1)(c))

49. ◯ ◯ ◯ Is a preset timer on the control panel available? (09-.21(2)(c))

50. ◯ ◯ ◯ If timing device is used as a backup device, is it always set at the time required to give the required dose? (09-.21(2)(c))

51. ◯ ◯ ◯ Full calibration measurements performed on each therapeutic accelerator?. (09-.21(2)(d))
[annually **or**, following any repair of the unit of components associated with radiation exposure **or**, whenever spot-check measurements indicate output measurements differing more than 5% from the value obtained at the last full calibration]

52. ◯ ◯ ◯ Records maintained of the annual calibration. (09-.21(2)(m))

53. ◯ ◯ ◯ Full calibration measurements include applicable exposure rates to within plus or minus 3%, radiation and light field congruence, radiation field uniformity, timer accuracy, and distance measuring device accuracy. (09-.21(2)(e))

54. ◯ ◯ ◯ Full calibration measurements performed by a Qualified Expert as defined in 0400-20-04-.04(1)(pp). (09-.21(2)(g)

55. ◯ ◯ ◯ Registrant's evaluation of the Qualified Expert's training and experience, performed and record maintained. (09-.21(2)(m))

56. ◯ ◯ ◯ Spot-check measurements performed on each therapeutic accelerator at intervals not exceeding one month. (09-.21(2)(h))

57. ◯ ◯ ◯ Records maintained of the monthly spot-check tests. (09-.21(2)(m))

58. ◯ ◯ ◯ Spot checks include timer accuracy, radiation and light field congruence, distance measuring device accuracy, and exposure rate. (09-.21(2)(i))

59. ◯ ◯ ◯ Spot checks performed in accordance with procedures established by a Qualified Expert, and reviewed by the Qualified Expert within 15 days if the checks were not made by the Qualified Expert. (09-.21(2)(j))

Dosimetry System Calibration **[Questions 60 –62]**

60. ◯ ◯ ◯ Full calibration measurements performed with a dosimetery system calibrated by the national Bureau of Standards or by a Regional Calibration Laboratory accredited by the American Association of Physicists in Medicine (AAPM). (09-.21(2)(k))

61. ◯ ◯ ◯ Full calibration measurement dosimetery systems calibrated within the previous 2 years and after any servicing that may have affected calibration. (09-.21(2)(k))

62. ◯ ◯ ◯ Spot check measurements performed with a calibrated dosimetery system. This system can be calibrated as outlined in 0400-20-09-.21(2)(k) or alternatively, by intercomparison with a full calibration measurement system. (09-.21(2)(l))
(Note: If alternative intercomparison calibration method is used, that calibration shall be performed within the previous year)

63. ◯ ◯ ◯ Operator able to continuously observe patients during irradiation from the control panel. (09-.21(3)(a))

64. ◯ ◯ ◯ Within the accelerator room, is there a readily available warning light or lights that operate when and only when radiation is being produced? (09-.21(3)(c))

65. ◯ ◯ ◯ All misadministrations properly reported under 0400-20-05-.145.
*[If no misadministrations, circle '*N/A*']*

Industrial (non-human) Use Requirements **[Questions 66 – 71]**

Note: If the room where the accelerator is located does not reach a high radiation area (dose rates greater than 100 mrem/hour), questions 66 – 71 are N/A. For example, a self-shielding cyclotron.

66. ◯ ◯ ◯ Interior of room equipped with visual flashing or rotating light that operates only when radiation is being produced. (09-.17(4)(g))

67. ◯ ◯ ◯ Each entrance has a visual warning device that operates only when radiation is being produced. (09-.17(4)(g))

68. ◯ ◯ ◯ Audible warning device available. (09-.17(4)(h))

69. ◯ ◯ ◯ Audible warning signal activated at least 5 seconds prior to the production of radiation. (09-.17(4)(h))

70. ◯ ◯ ◯ Delay of at least 30 seconds between the start of the audible warning signal and production of a High Radiation Area. (09-.17(4)(h))

71. ◯ ◯ ◯ Audible warning signal clearly discernable inside and outside room. (09-.17(4)(h))

Operator Training **[Questions 72 - 75]** ***(applies to both industrial and human use)***

72. ◯ ◯ ◯ Registrant has instructed all operators in subjects outlined in 0400-20-09-.22. (09-.18(1))

73. ◯ ◯ ◯ Registrant has insured that operators have received copies of and instruction in the regulations (chapters 5 and 9), the Certified Registration, the operating and emergency procedures. (09-.18(2))

74. ◯ ◯ ◯ Registrant has insured that each operator has physically demonstrated competence to use the accelerator, related equipment, and survey instruments. (09-.18(3))

75. ◯ ◯ ◯ Does registrant's operating and emergency procedures comply with 0400-20-09-.19 and 0400-20-09-.21(1)(b)? *[Note: 0400-20-09-.21(1)(b) applies to human use only]*

0400-20-09-.19 requirements:

- ☐ Exposure limits of 0400-20-05 maintained
- ☐ Methods and occasions for conducting surveys
- ☐ Methods for controlling access to high radiation areas
- ☐ Methods and occasions for locking the control panel
- ☐ Personnel monitoring and the use of pm equipment
- ☐ Methods for minimizing exposure of individuals in the event of an accident
- ☐ Notification procedures in the event of an accident
- ☐ The maintenance of records

0400-20-09-.21(1)(b) requirements for emergency procedures:

- ☐ Minimizing exposure of individuals in the event of an accident, e.g., alternate means of terminating the accelerator beam
- ☐ Removing the patient form the treatment room
- ☐ Preventing the entrance of individuals into the treatment room
- ☐ Notifying the responsible physician or RSO

Notes Meter, S/N, & Calibration Date: