

# Incore Neutron Monitoring System

## Chapter 9.2



# Objectives

1. Describe the basic operation of the incore neutron monitoring system (ICI).
2. Explain the functions of the incore neutron monitoring system.
3. Explain the functions of the core exit thermocouple system (CET).

# Functions of the ICI system:

1. To determine the gross power distribution in the core at different operating conditions over the range from 10 to 125% average reactor power,
2. To provide data to estimate the fuel burnup in each fuel assembly,
3. To provide information to guide the operation of control element assemblies in the control of xenon oscillations and to ensure that power peaking factors do not exceed allowable limits during this maneuvering of the control element assemblies,
4. To provide data for the evaluation of thermal margins in the core,

# Functions of the ICI system:

5. To provide data which will be used to verify core power distribution is consistent with calculated values,
6. To provide data to periodically normalize the excore detector readings to assure that they indicate the correct top to bottom distribution and correct power distribution among quadrants and
7. To provide signals to alert the operator to abnormal or unexpected occurrences in the core.



Figure 9.2-1 Self Powered Neutron Detector

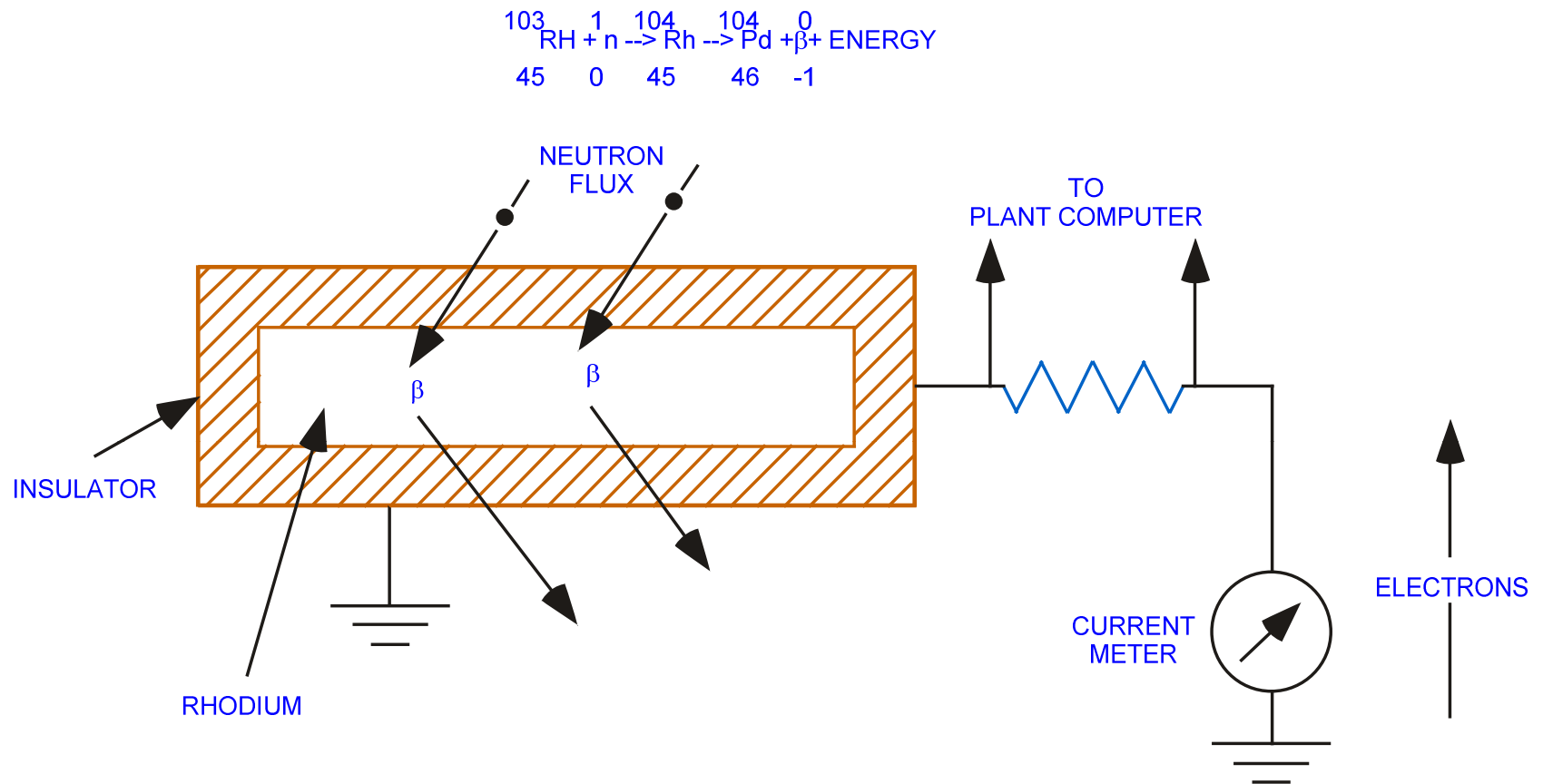


Figure 9.2-2 Rhodium Decay Scheme

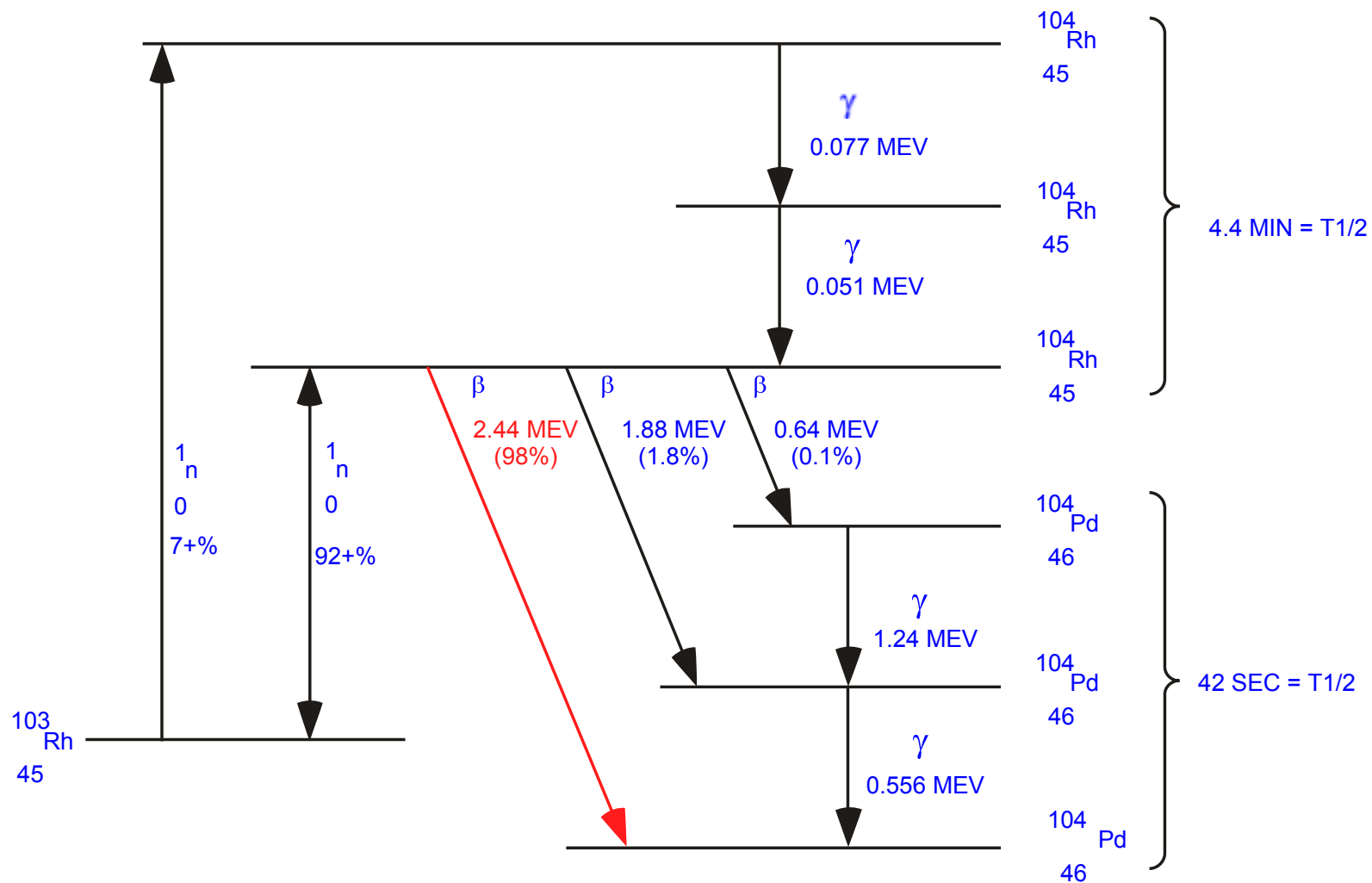
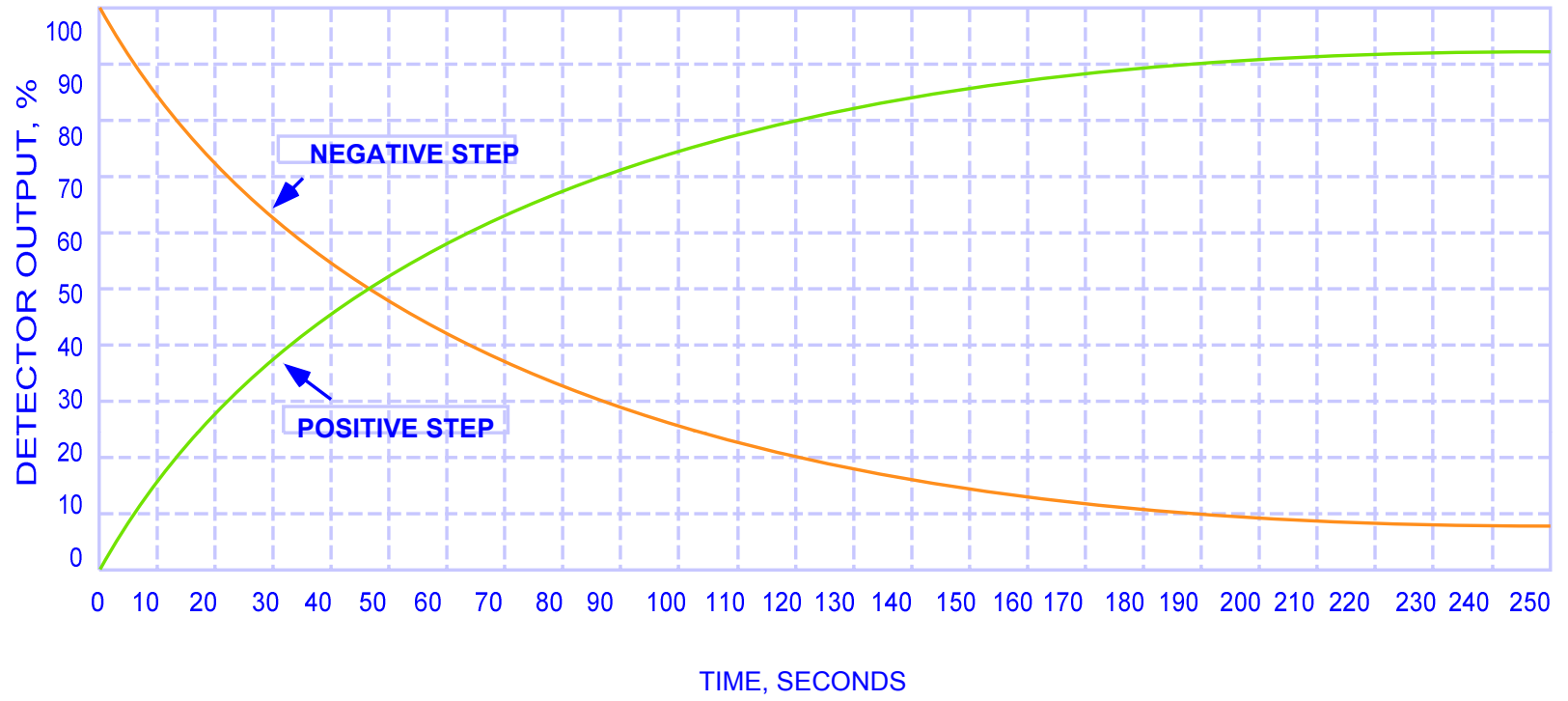


Figure 9.2-3 Rhodium Detector Response



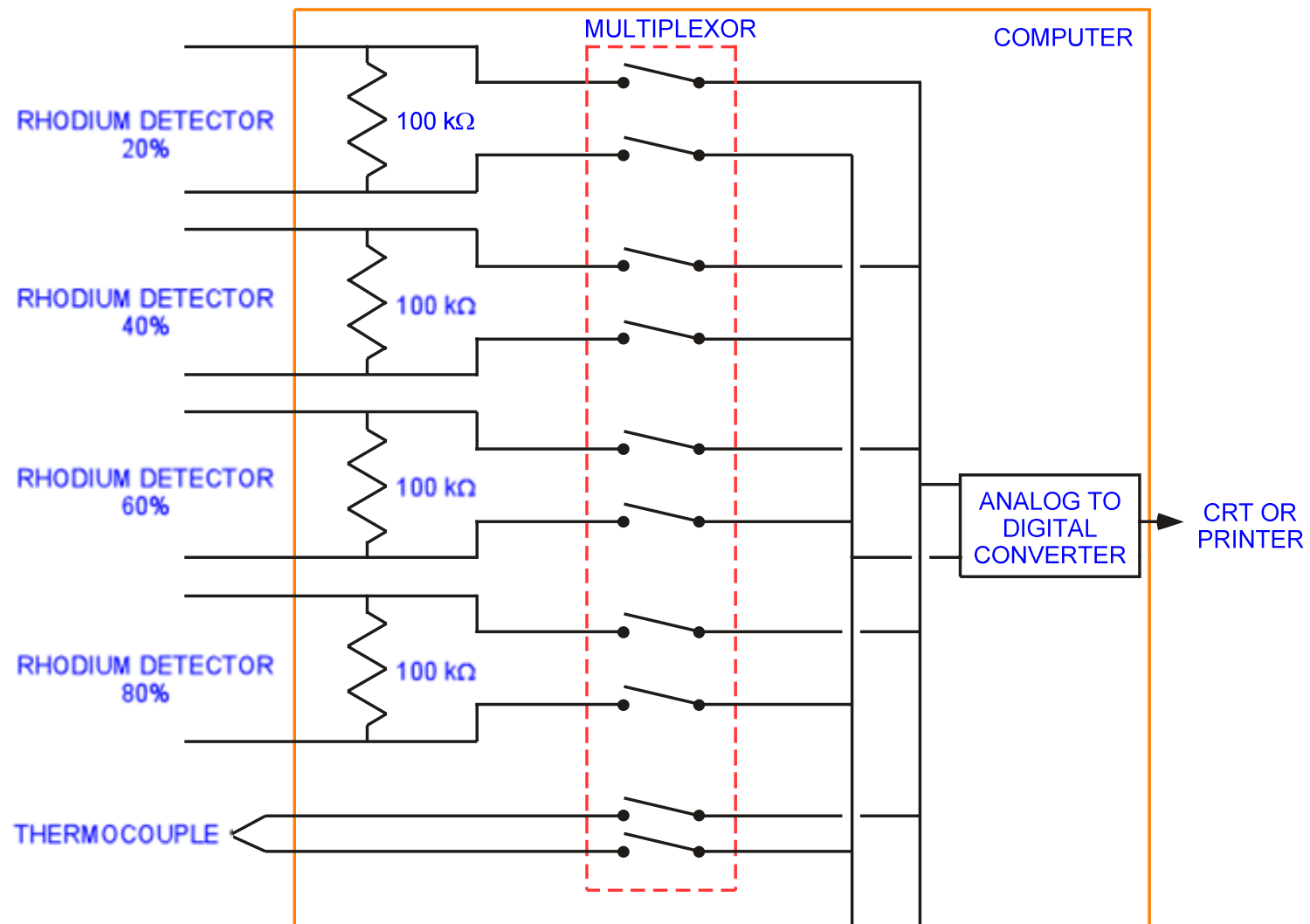




Figure 9.2-5 Incore Detector Axial Arrangement

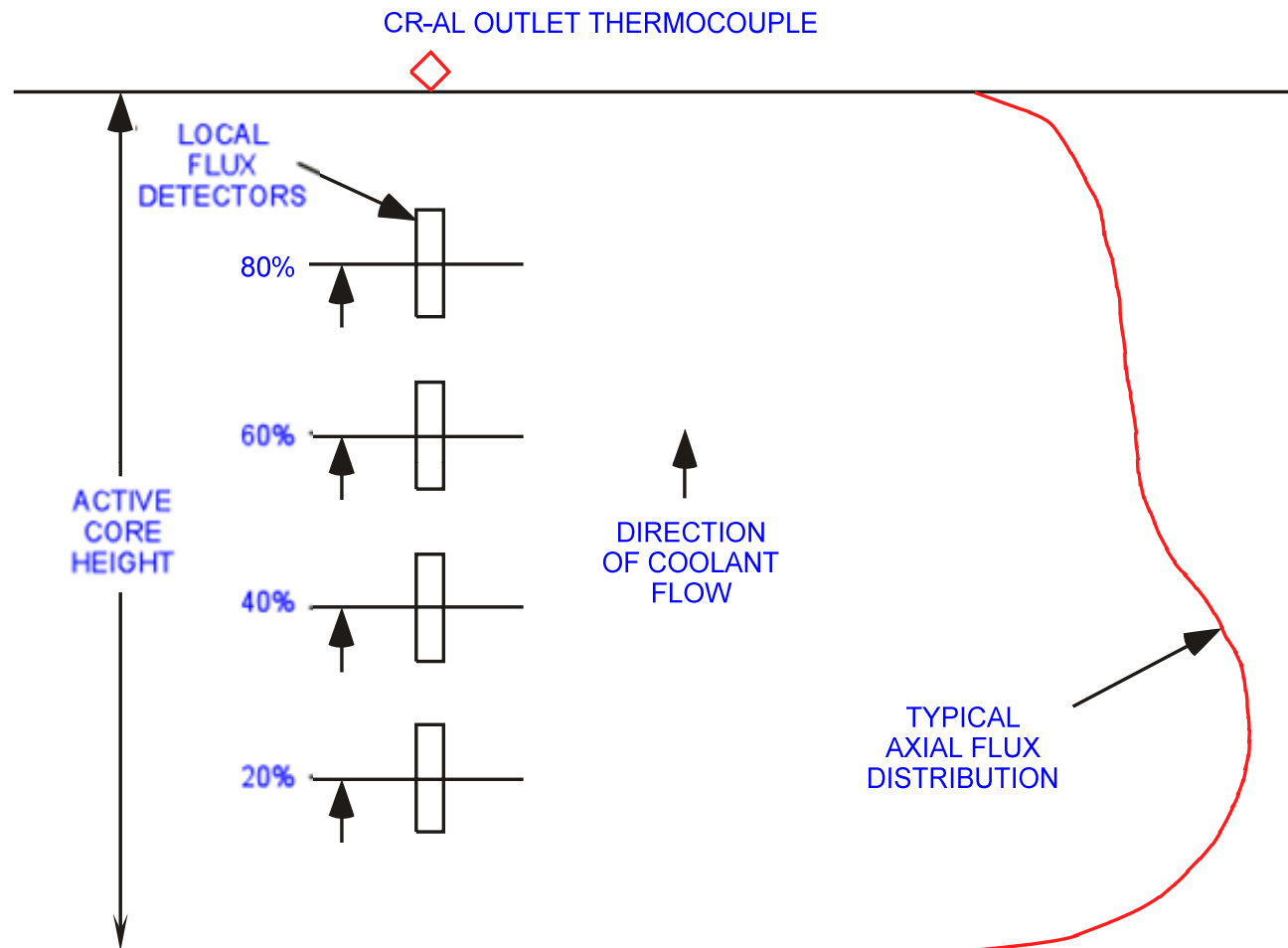
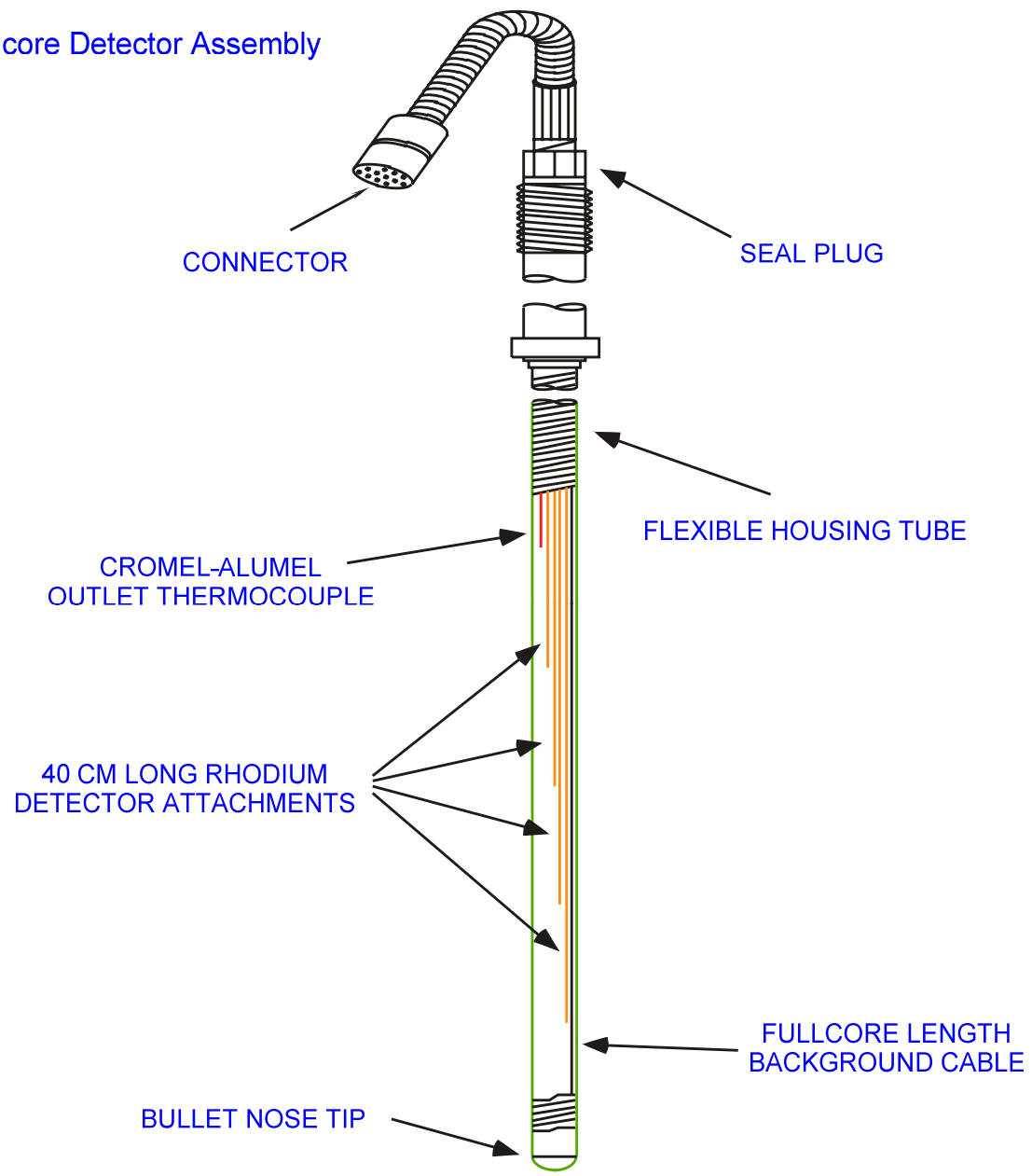


Figure 9.2-6 Incore Detector Assembly





**The End**