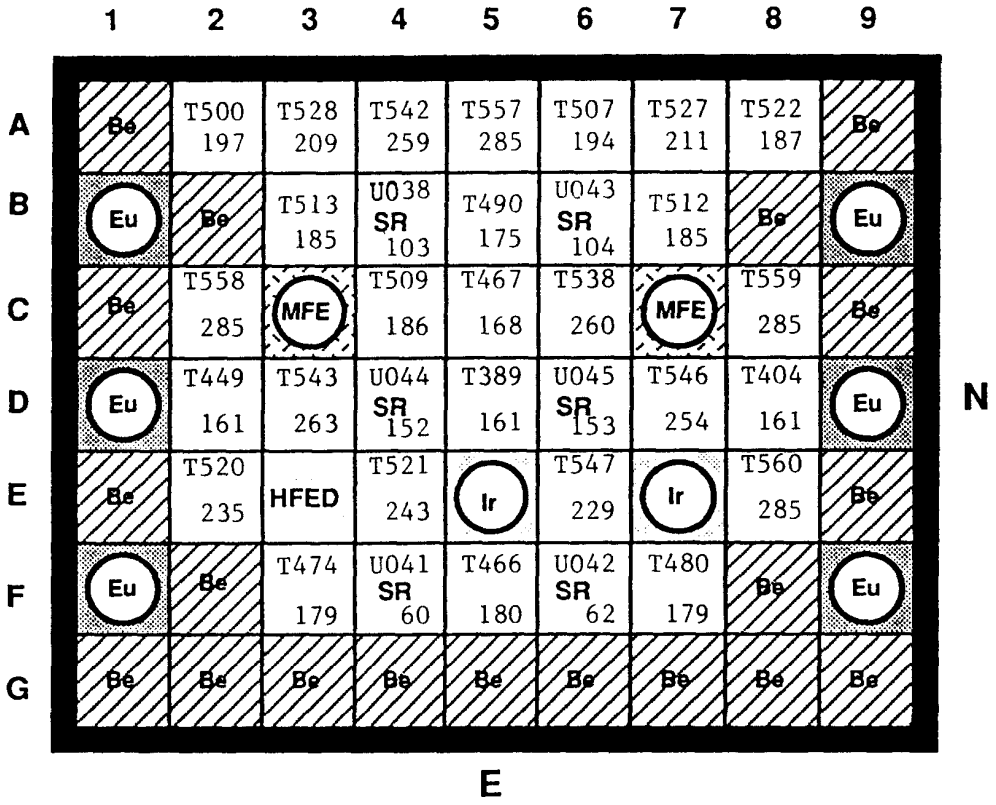
APPENDIX A

Core Configurations, Fuel Element Locations, and BOC 235U Fuel Element Masses

Figures A. I to A.22 provide a collection of core maps for each of the cores operated at full power (30 MW) during the demonstration. Each map gives fuel element locations, identifications, and BOC ^{235}U masses. For the irradiated fuel elements in the core, BOC ^{235}U masses were obtained from previous REBUS-3 bumup calculations. The prefixes T, B, C and N identify HEU fuel elements fabricated by Texas Instruments or Babcock and Wilcox (T) and LEU elements fabricated by Babcock and Wilcox (B), CERCA (C), and NUKEM (N), respectively. HEU and LEU shim rod followers are identified with the prefixes U and UB, respectively. For previously irradiated HEU fuel elements the ^{140}La and ^{137}Cs gamma-scanning data were combined to determine the ^{235}U fuel element masses at the beginning of the demonstration. The ORR initial mass estimate was used for those HEU elements for which no gamma scanning data were recorded.

ORR CORE 174C

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

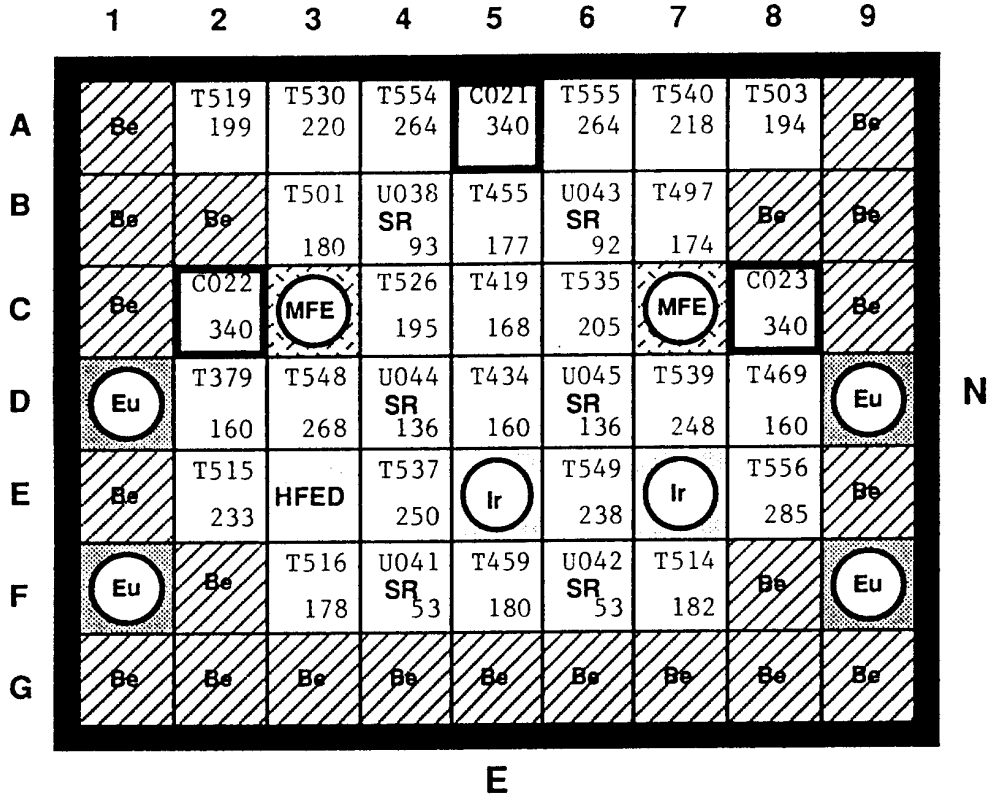
HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

Be = Beryllium Reflector Element

Fig. A.1

ORR CORE 174D

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

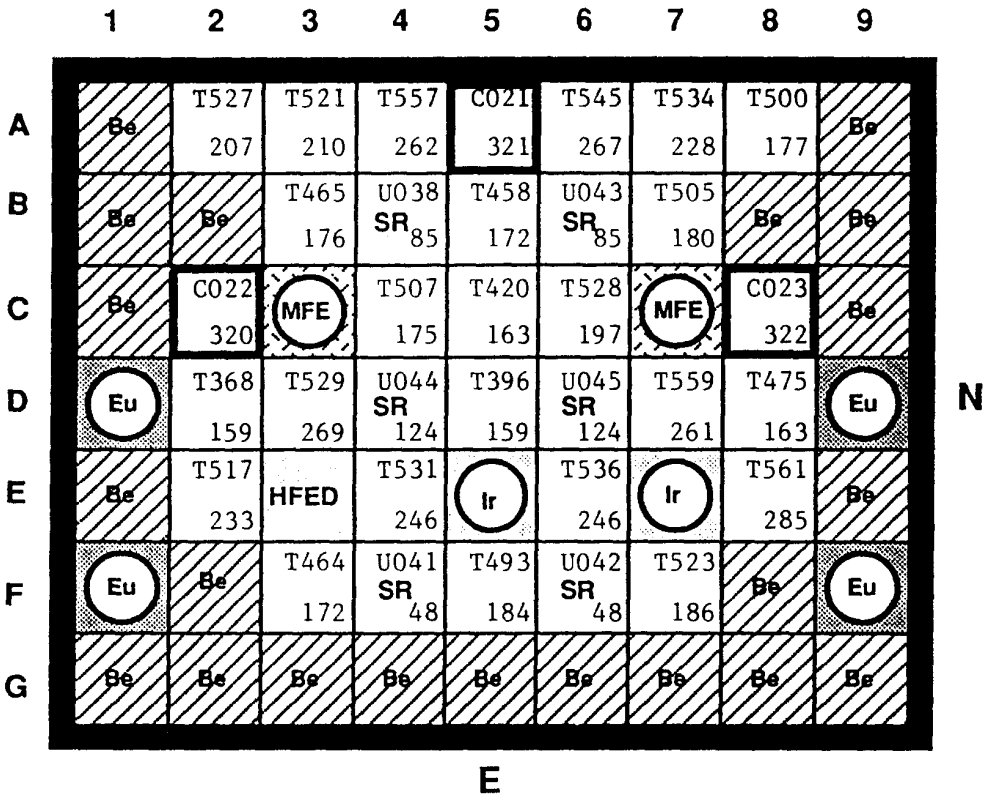
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.2

ORR CORE 174E

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

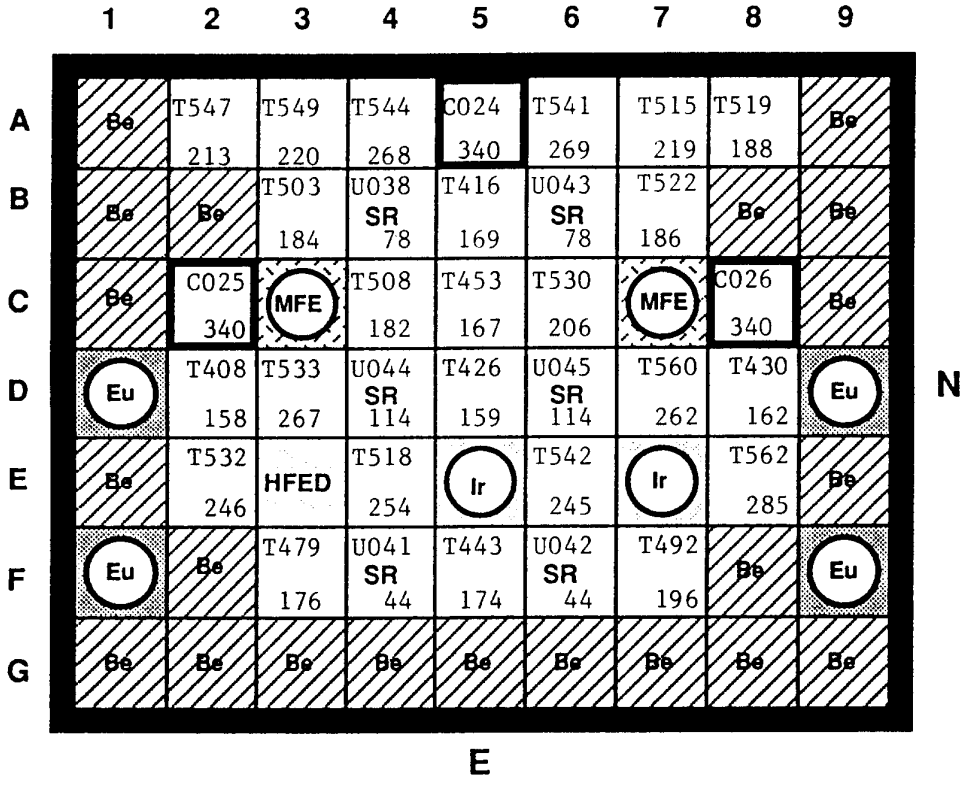
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.3

ORR CORE 174F

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

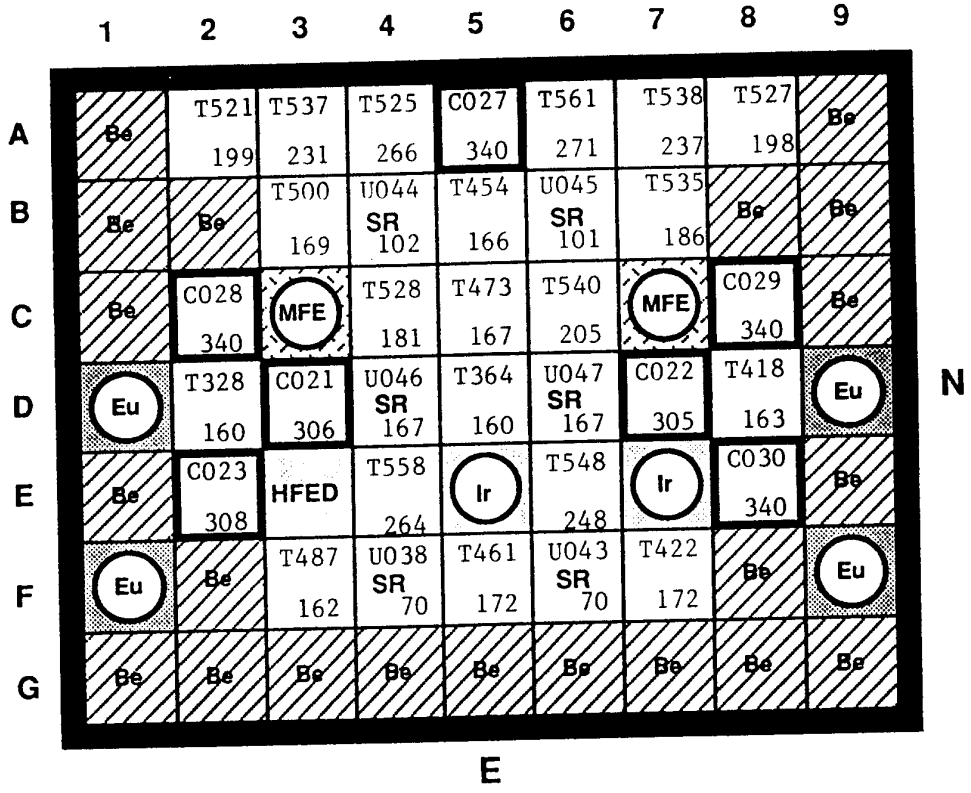
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.4

ORR CORE 175A

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

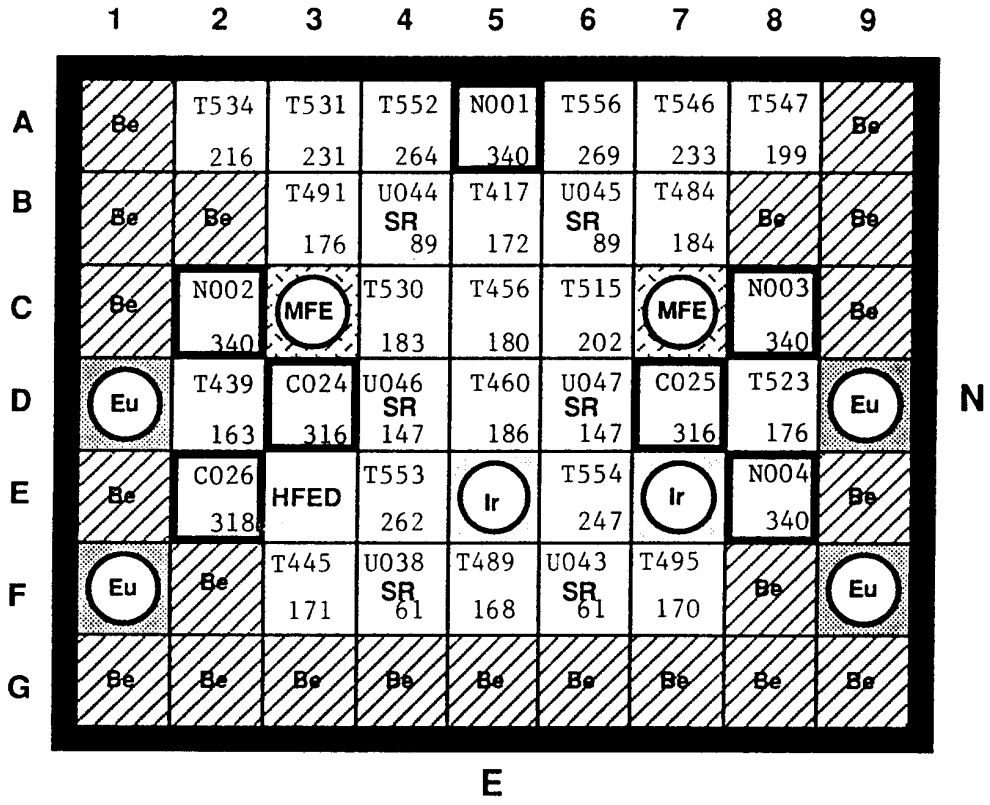
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.5

ORR CORE 175B

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

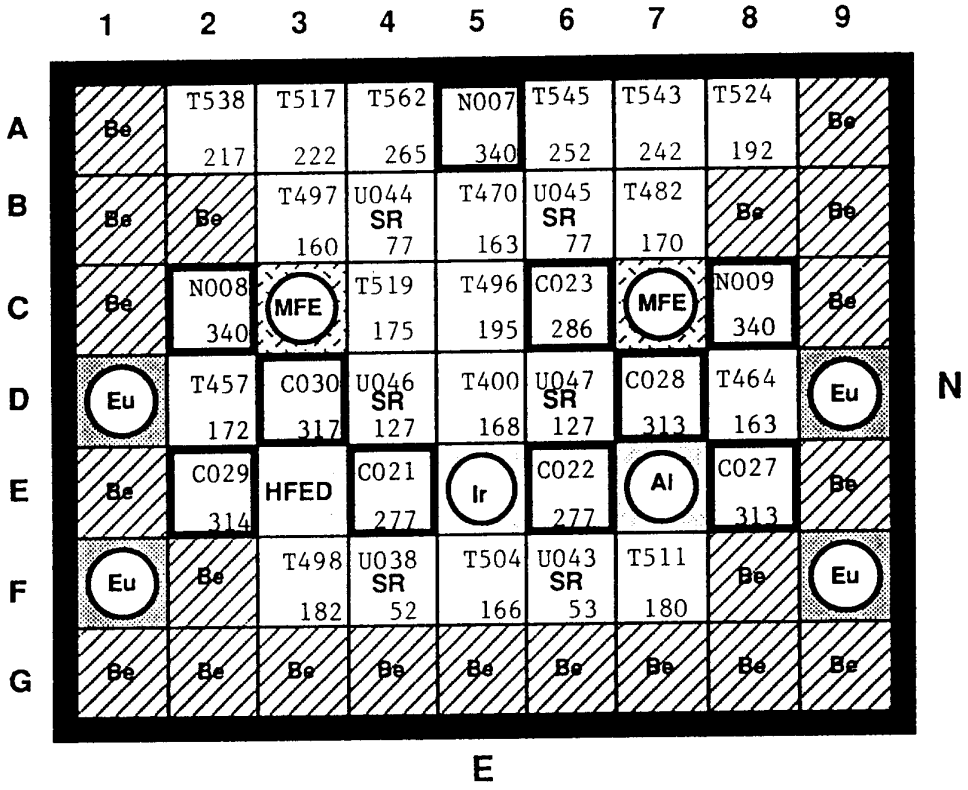
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.6

ORR CORE 175C

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

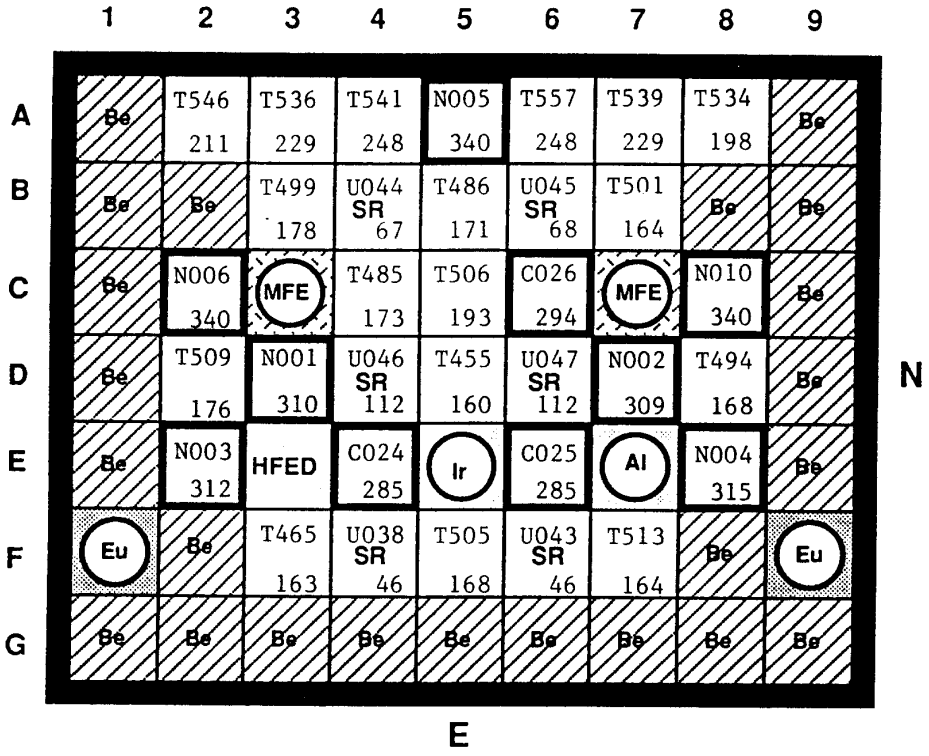
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.7

ORR CORE 176A

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

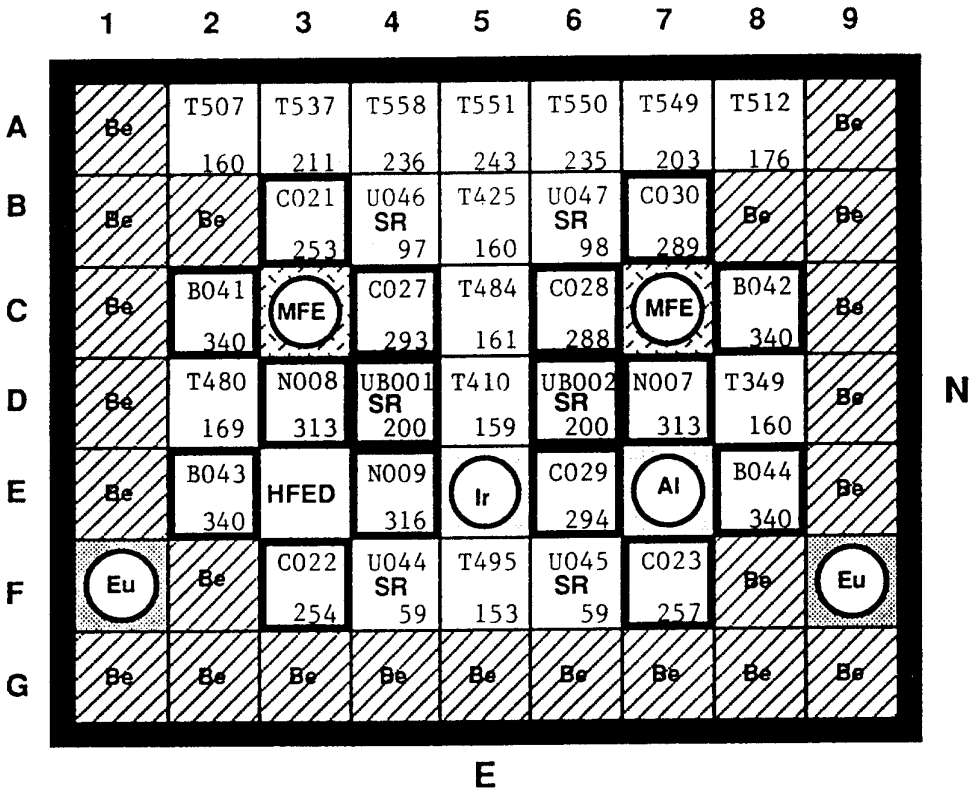
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.8

ORR CORE 176B

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

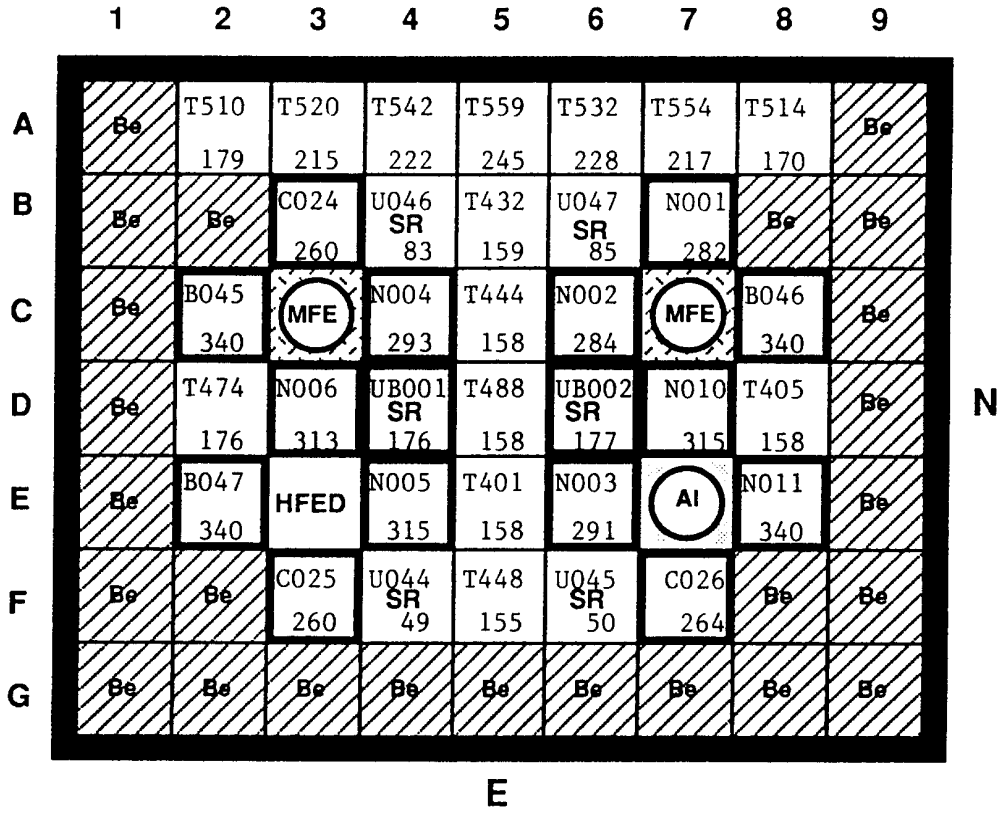
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.9

ORR CORE 176C

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

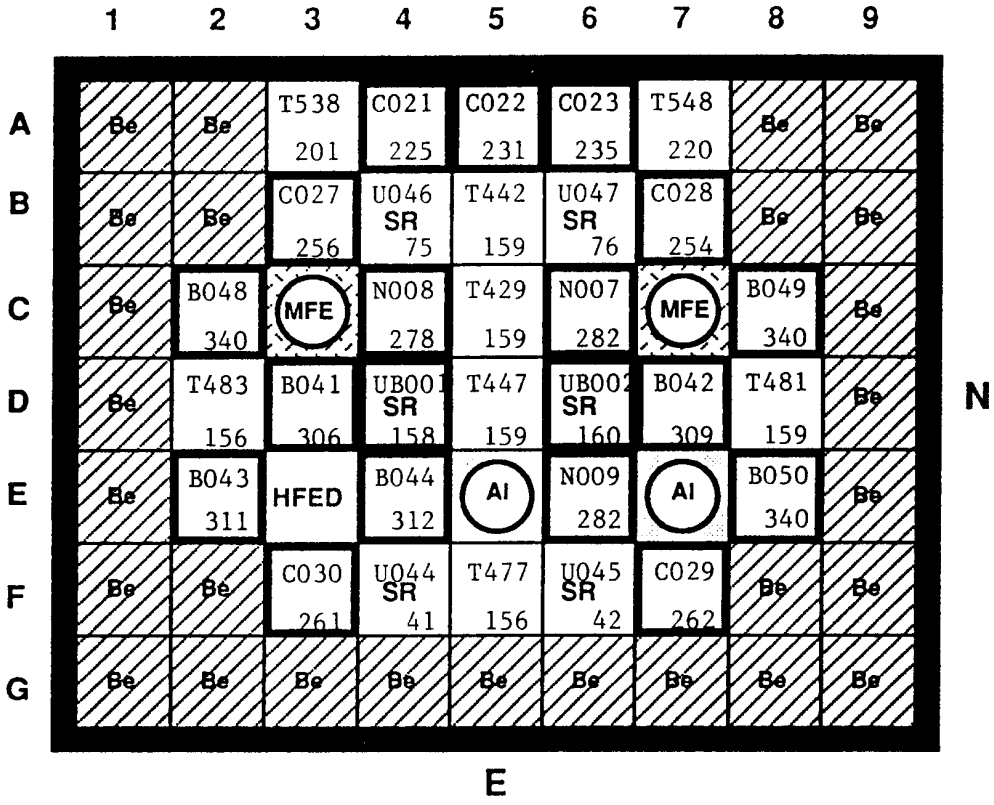
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.10

ORR CORE 176D

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

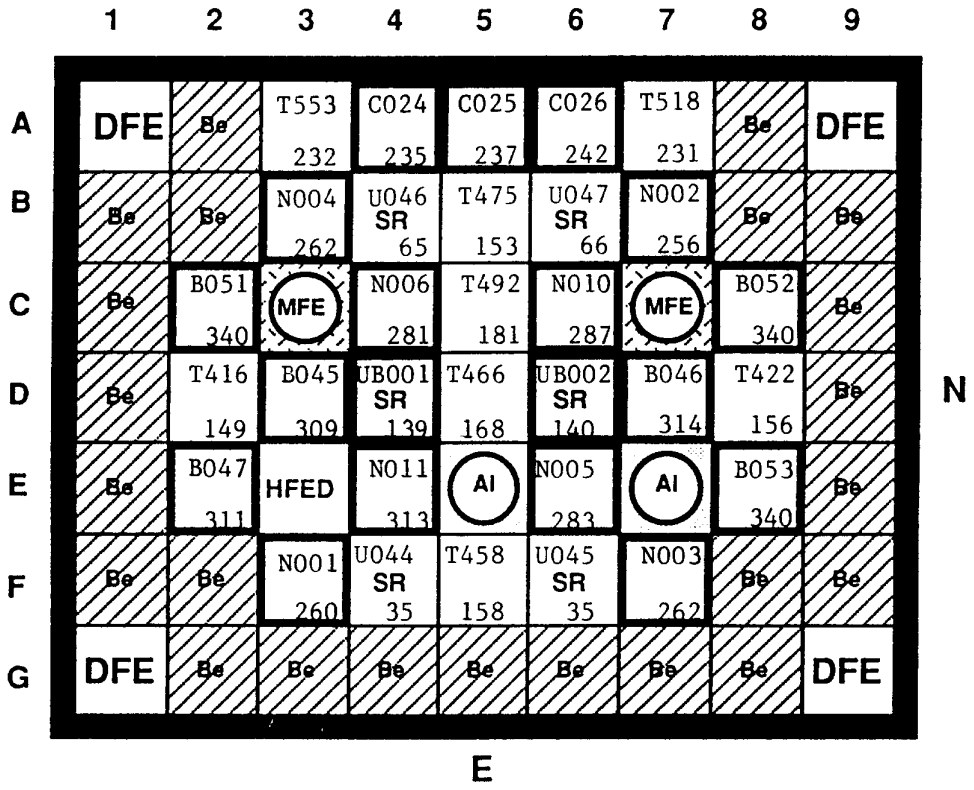
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.11

ORR CORE 177A

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

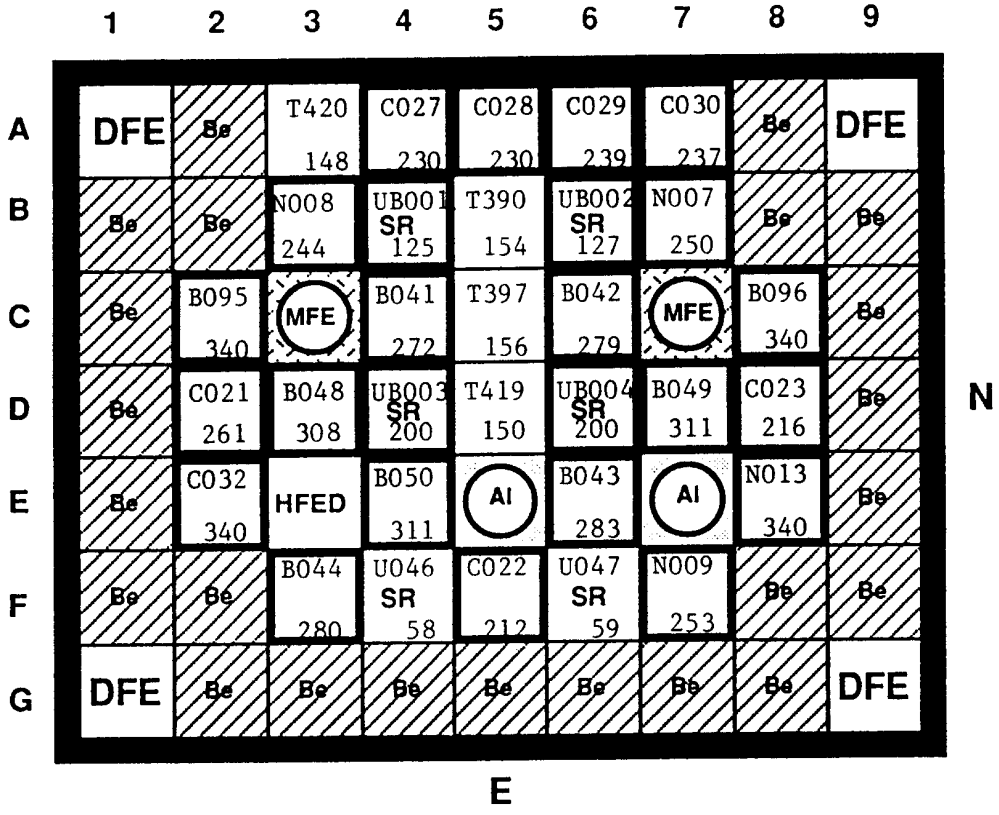
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.12

ORR CORE 177B

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

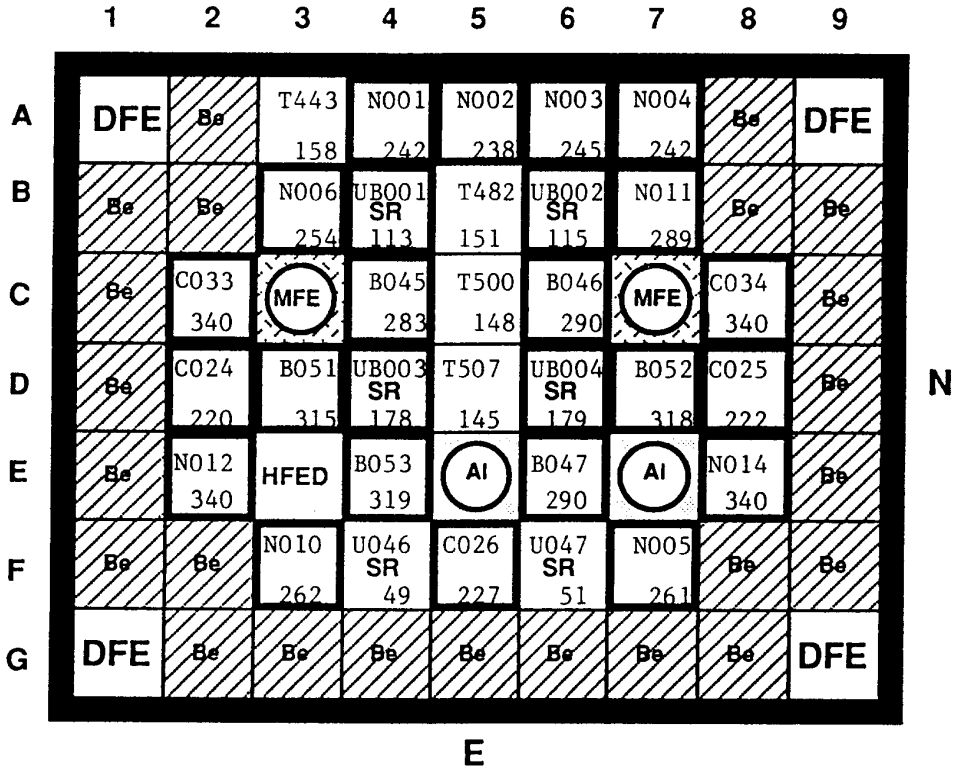
Be = Beryllium Reflector Element

 = LEU Fuel Element

Fig. A.13

ORR CORE 177C

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

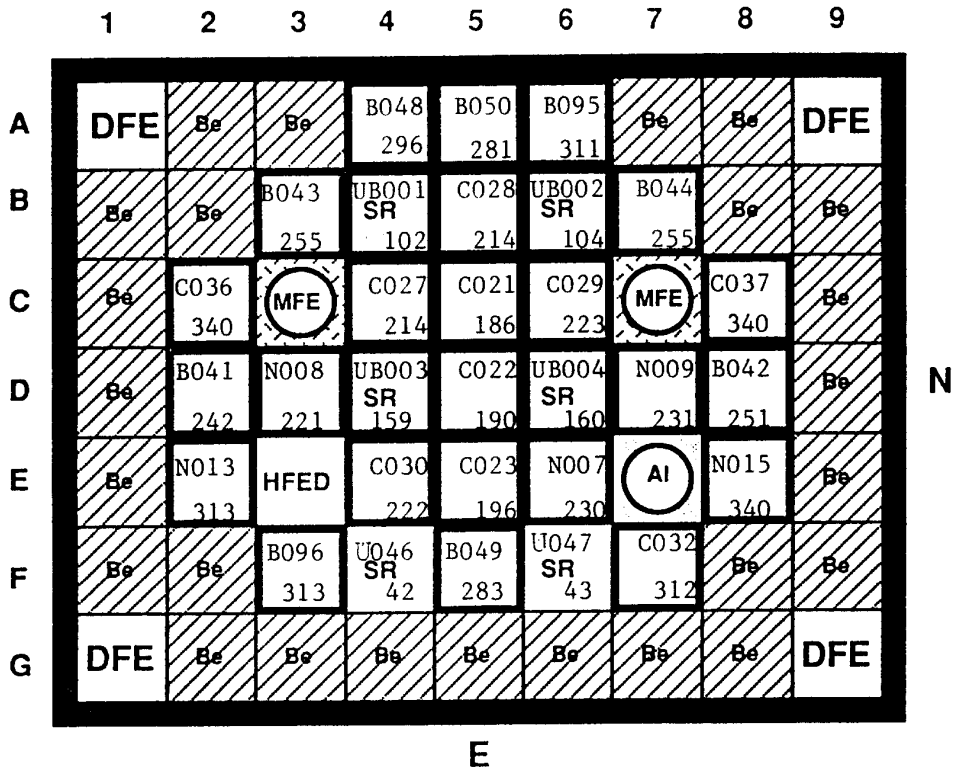
Be = Beryllium Reflector Element

= LEU Fuel Element

Fig. A.14

ORR CORE 177D

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

Be = Beryllium Reflector Element

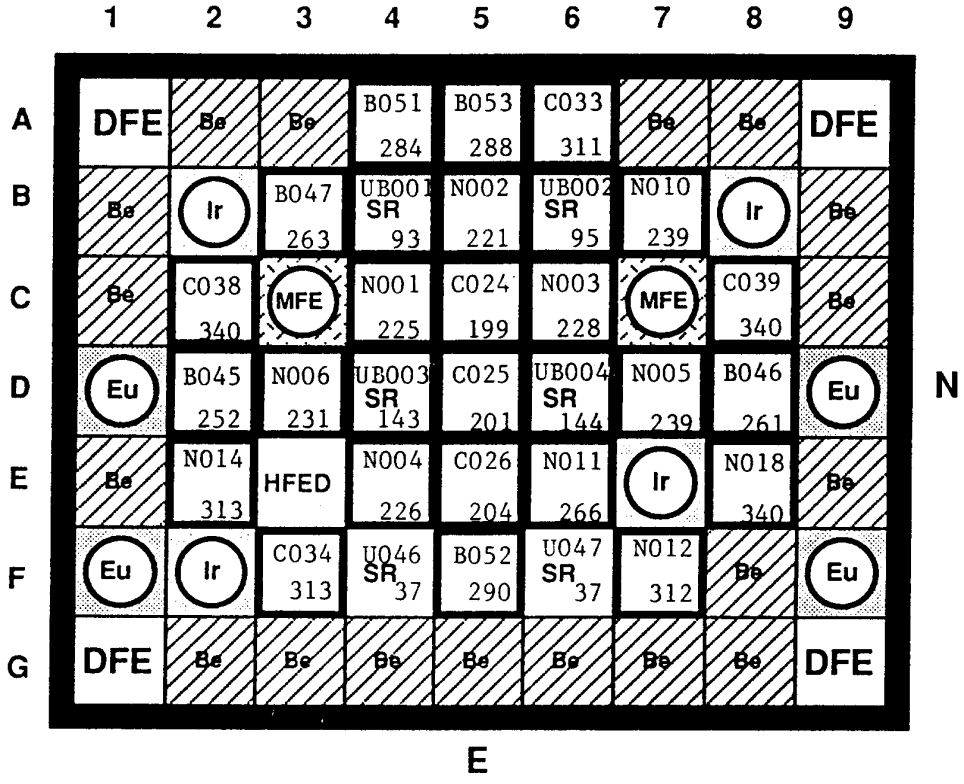
Al = Aluminum Reflector Element

= LEU Fuel Element

Fig. A.15

ORR CORE 178A

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

Be = Beryllium Reflector Element

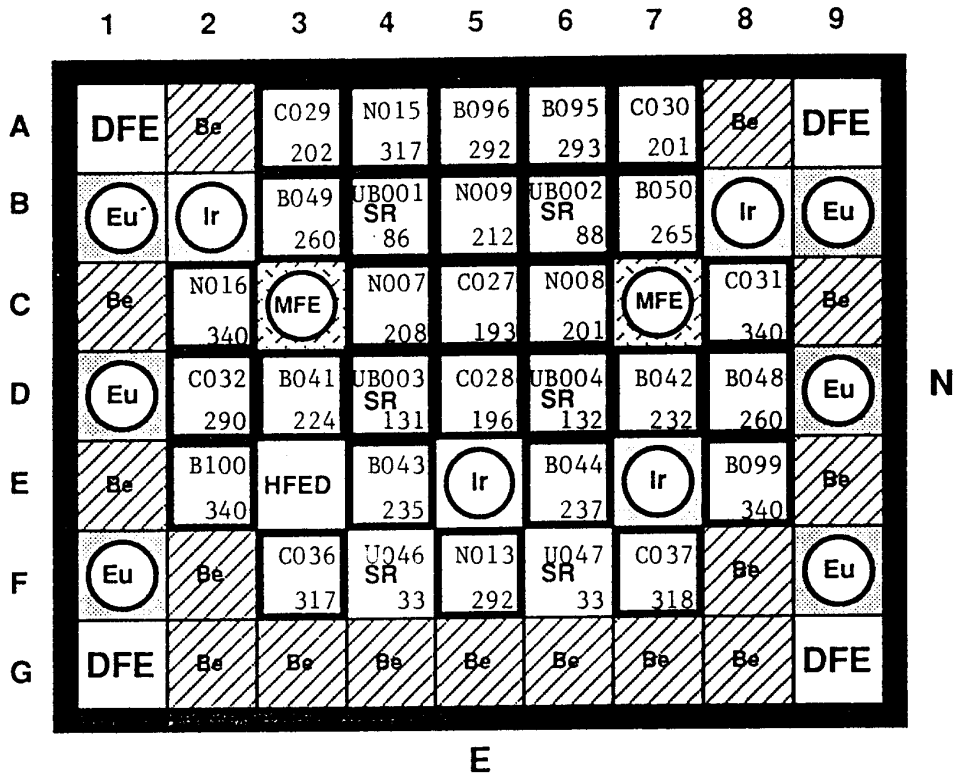
Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

= LEU Fuel Element

Fig. A.16

ORR CORE 178B

Fuel Element Map and BOC U235 Masses (g)



SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

Be = Beryllium Reflector Element

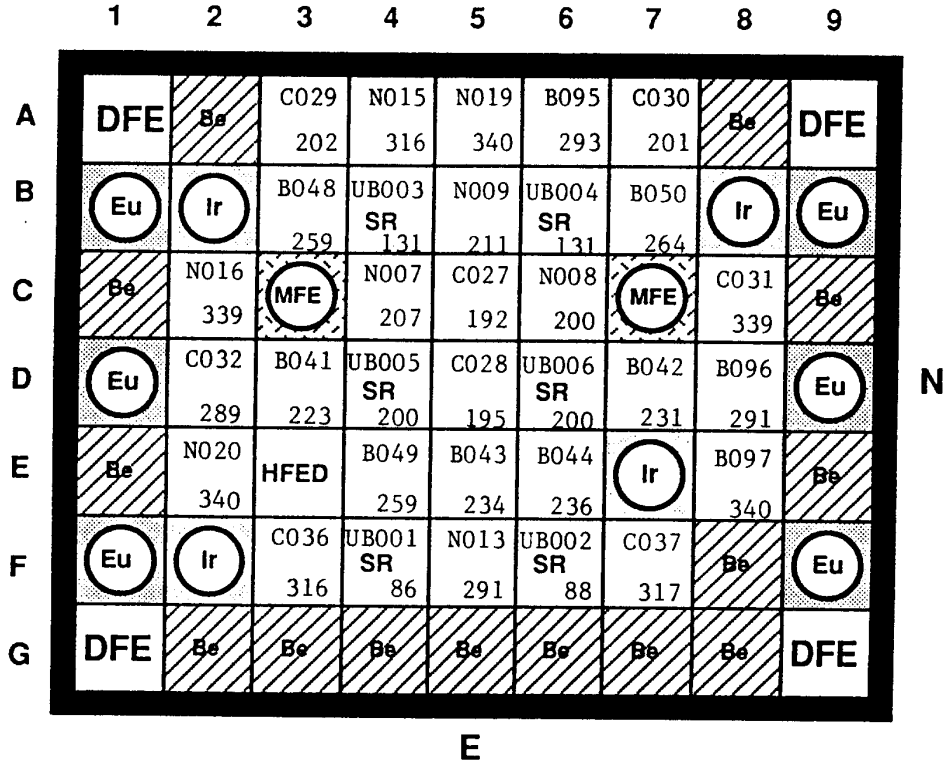
Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

= LEU Fuel Element

Fig. A.17

ORR CORE 178C

Fuel Element Map and BOC U235 Masses (g)



All LEU Core

SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

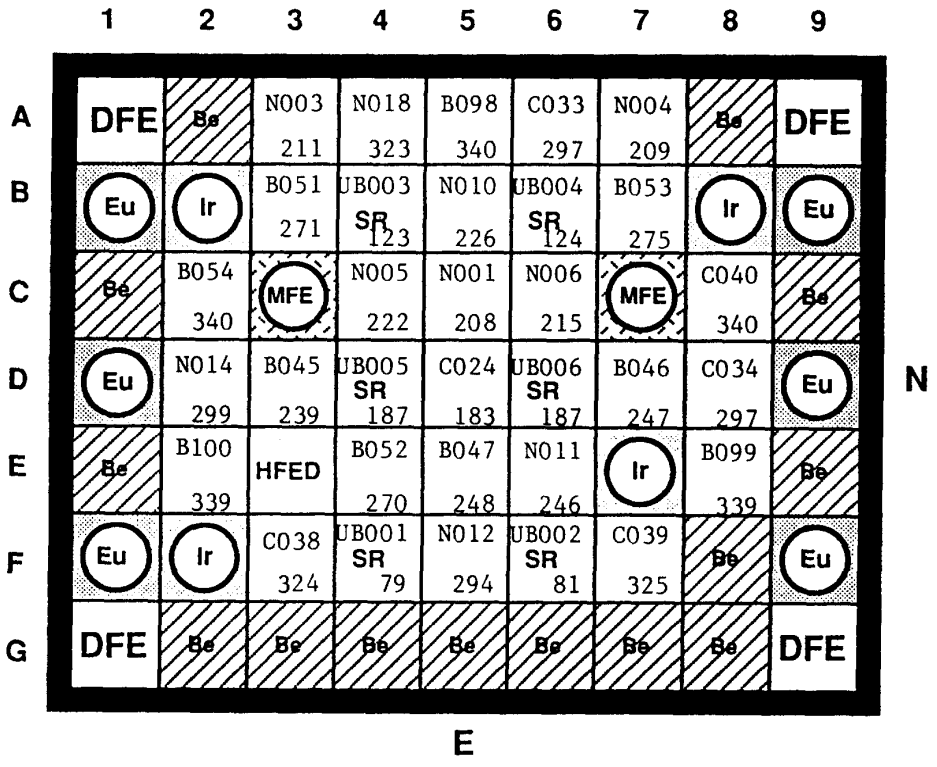
Be = Beryllium Reflector Element

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

Fig. A.18

ORR CORE 178D

Fuel Element Map and BOC U235 Masses (g)



All LEU Core

SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

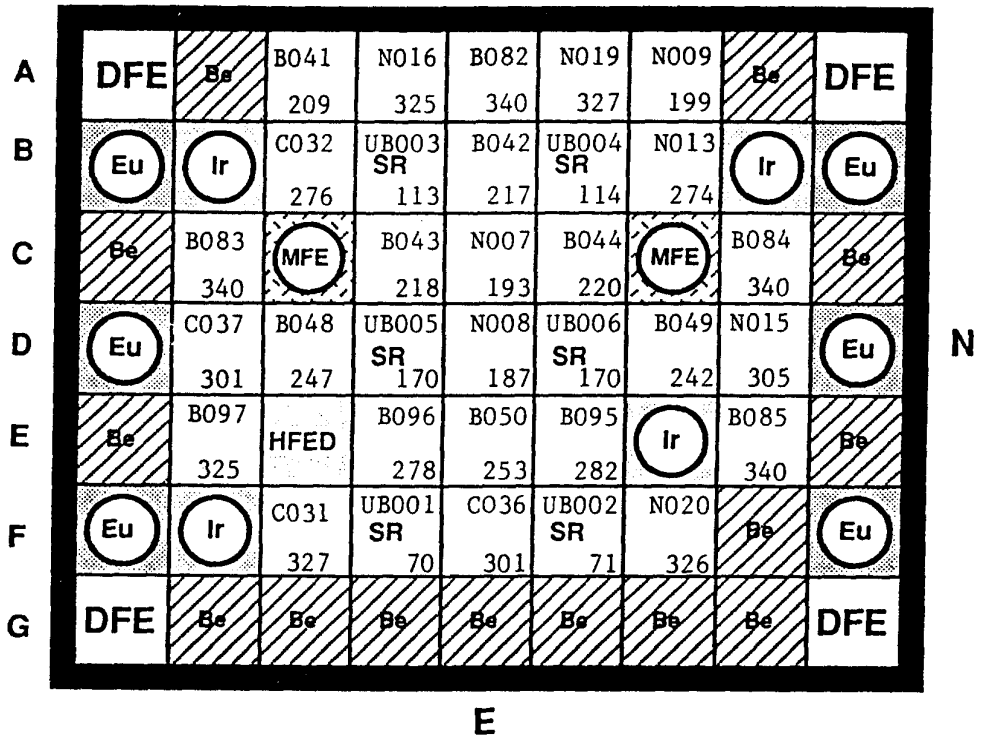
Be = Beryllium Reflector Element

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

Fig. A.19

ORR CORE 178H

Fuel Element Map and BOC U235 Masses (g)



All LEU Core

SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

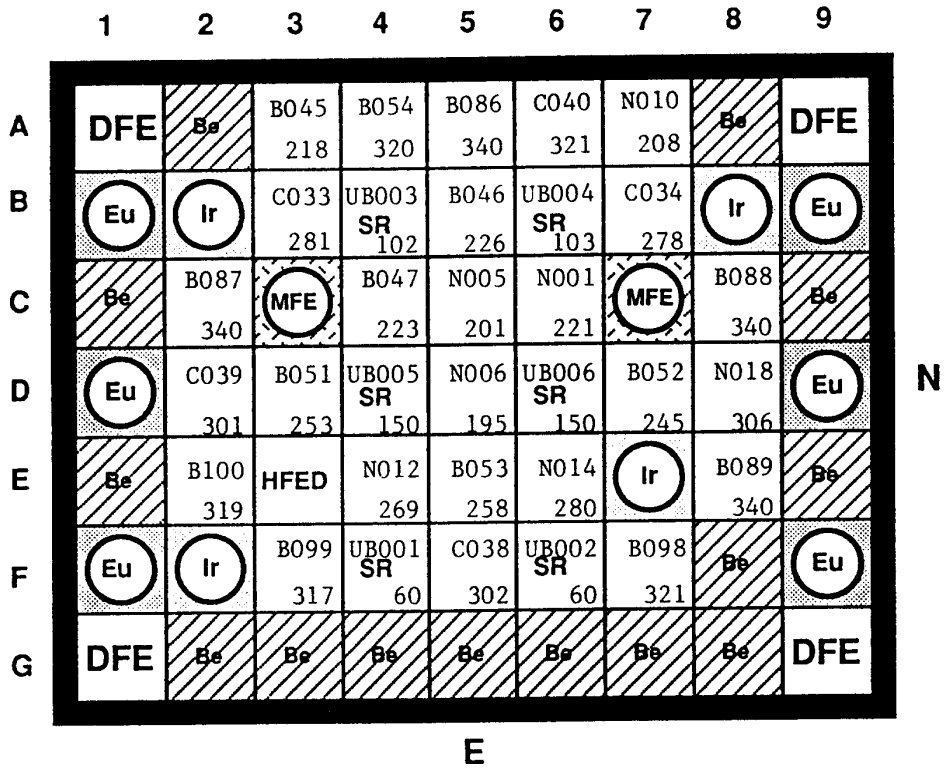
Be = Beryllium Reflector Element

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

Fig. A.20

ORR CORE 178J

Fuel Element Map and BOC U235 Masses (g)



All LEU Core

SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

HFED = High U-load Fuel Element Device for Mini-Plate Irradiations

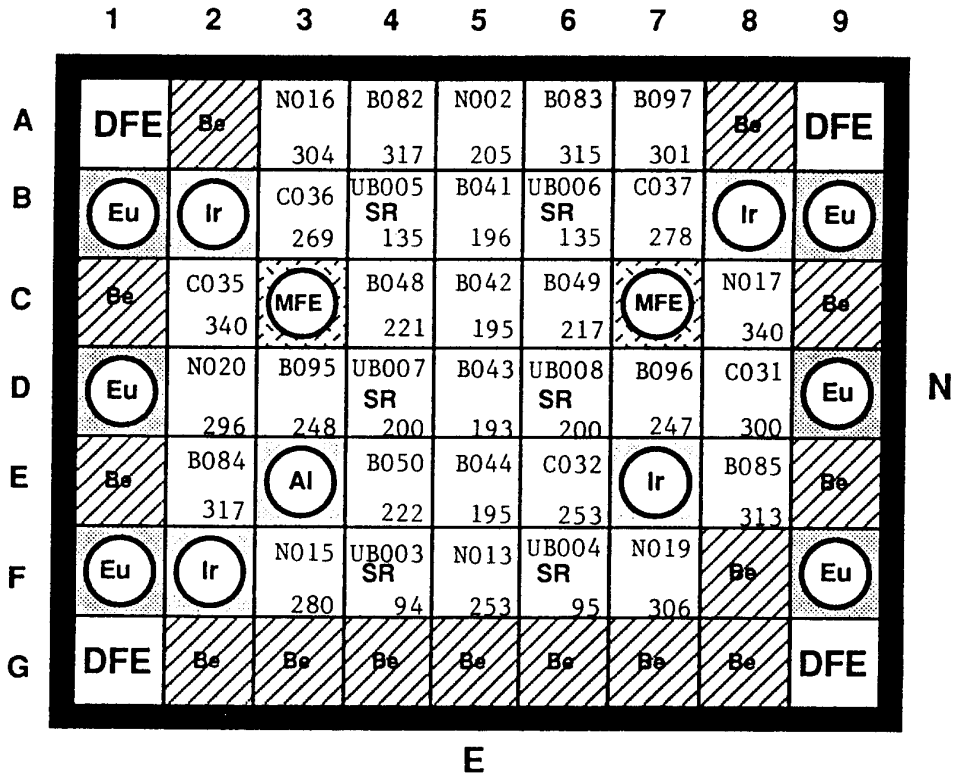
Be = Beryllium Reflector Element

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

Fig. A.21

ORR CORE 179A

Fuel Element Map and BOC U235 Masses (g)



All LEU Core

SR = Shim Rod Assemblies

MFE = Magnetic Fusion Experiment

DFE = Dummy Fuel Element

Be = Beryllium Reflector Element

Al = Aluminum Reflector Element

Ir, Eu = Irradiation Facility for Activating Iridium or Europium Samples

Fig. A.22