Nuclear Workforce Needs

Idaho National Laboratory

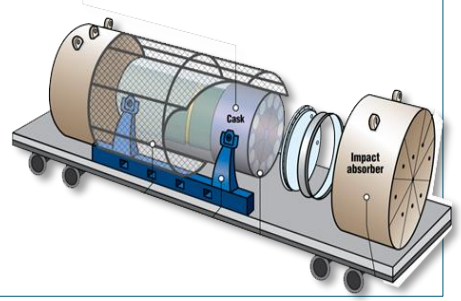
Nuclear Staffing Plan Brief
FY2020-FY2024*

Briefing Provided by Hope Morrow - Economist, Workforce Strategy & Development

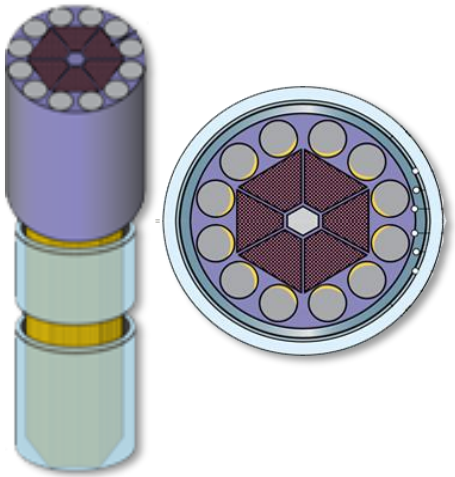
Nuclear Industry Growth Requires Research and Operations Talent

Demonstrate microreactor

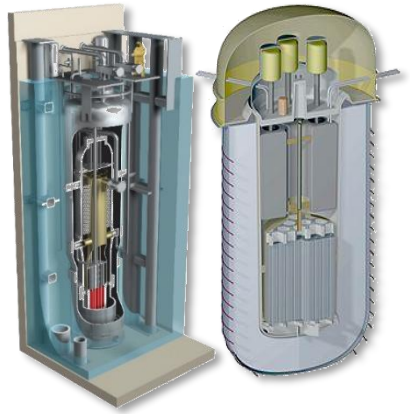
- Resolve key advanced reactor issues
- Open new markets for nuclear energy
- Provide a 'win' to build positive momentum



Commercial microreactors deployed

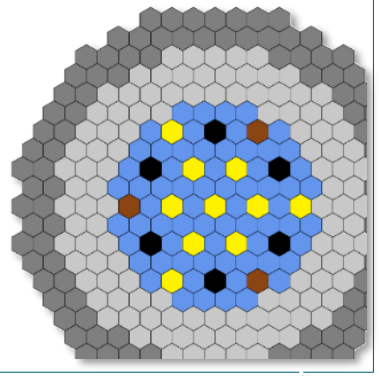


SMR-NuScale operating



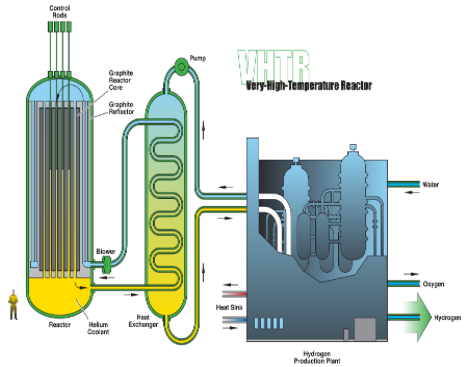
Versatile Test Reactor (VTR) operating by 2026

- Re-establish leadership in fast-spectrum testing and fuel development capability
- Supported by micro-reactor demonstration
- Support non-LWR advanced reactor demonstration



Non-LWR advanced demonstration reactors by 2030

- Demonstrate non-LWR technology replacement of U.S. baseload clean power capacity

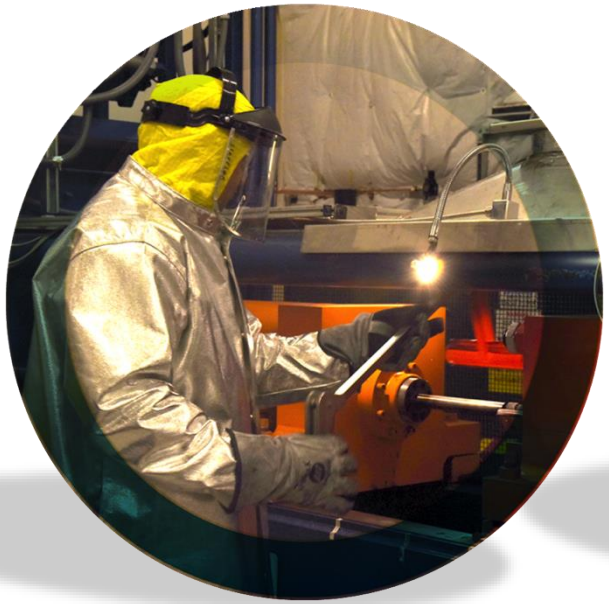


Naval Reactors Facility

- Naval Spent Fuel Handling Facility
- Cask Shipping and Receiving Facility and Overpack Storage Facility

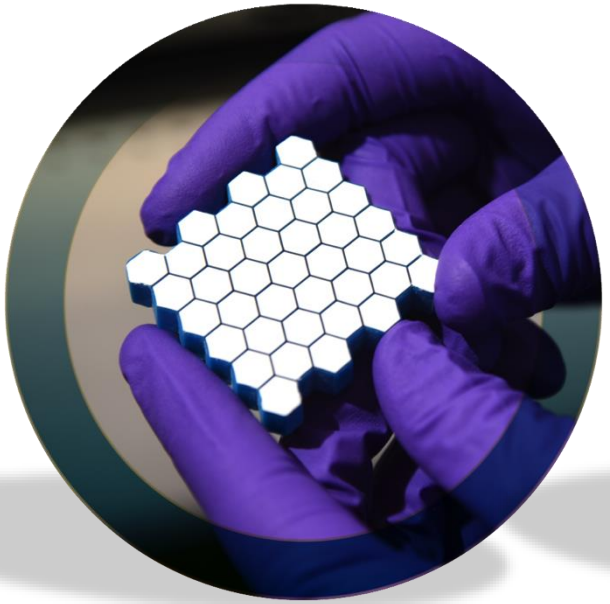
2021 2025 2026 2028 2030

INL's Growing Nuclear Mission Requires Talent in Many Disciplines



Advanced Reactor Design and Optimization

Fuel Cycle Technologies



Nuclear Fuels and Materials

Light Water Reactor Fleet Sustainability

INL Offers Opportunities to Students in Various Careers Pathways:

- Research
- Program Support
- Maintenance and Technicians
- Construction

INL Integrated Nuclear Workforce Needs

Data Parameters

- Timeline:
  - FY2020-FY2024 for NS&T, MFC, and ATR
  - FY2020-FY2026 for VTR

- These are full-time INL employment opportunities. Future construction positions associated with these organizations, other part-time and contracted positions are not counted here.

- The Nuclear Workforce at INL is 36% of the total current lab workforce (i.e., employees, interns, postdocs, and Grad Fellows). The information presented summarizes careers in both research and operations/maintenance for the following four organizations:
  - Nuclear Science and Technology (NS&T)
  - Materials and Fuels Complex (MFC)
  - Advanced Test Reactor (ATR)
  - Versatile Test Reactor (VTR)

Data Parameters - What's Not Included

The other 64% of Idaho National Laboratory's workforce specializes in a variety of fields supporting the nuclear research mission and the non-nuclear INL missions. Each of the following job categories also anticipate growth over the next five years, but those details are not provided in this briefing:

- Business Management
- Energy and Environmental Science and Technology
- Facilities and Site Services
- Governmental Affairs, Communication, and Education Outreach
- Human Resources
- Industry Engagement
- Information Management
- National and Homeland Security
- Safety, Health, and Quality

Annual Projected Opening Counts

1,017 Total Anticipated Openings to support INL's Nuclear Mission

These openings consist of both research focused occupations and careers in operations and maintenance, thus resulting in workforce needs that vastly range in educational levels and discipline, as well as experience and background.

Posting Scope	FY20	FY21	FY22	FY23	FY24
External	316	207	167	171	83
Internal	3	1	11	1	1
Conversion		4			

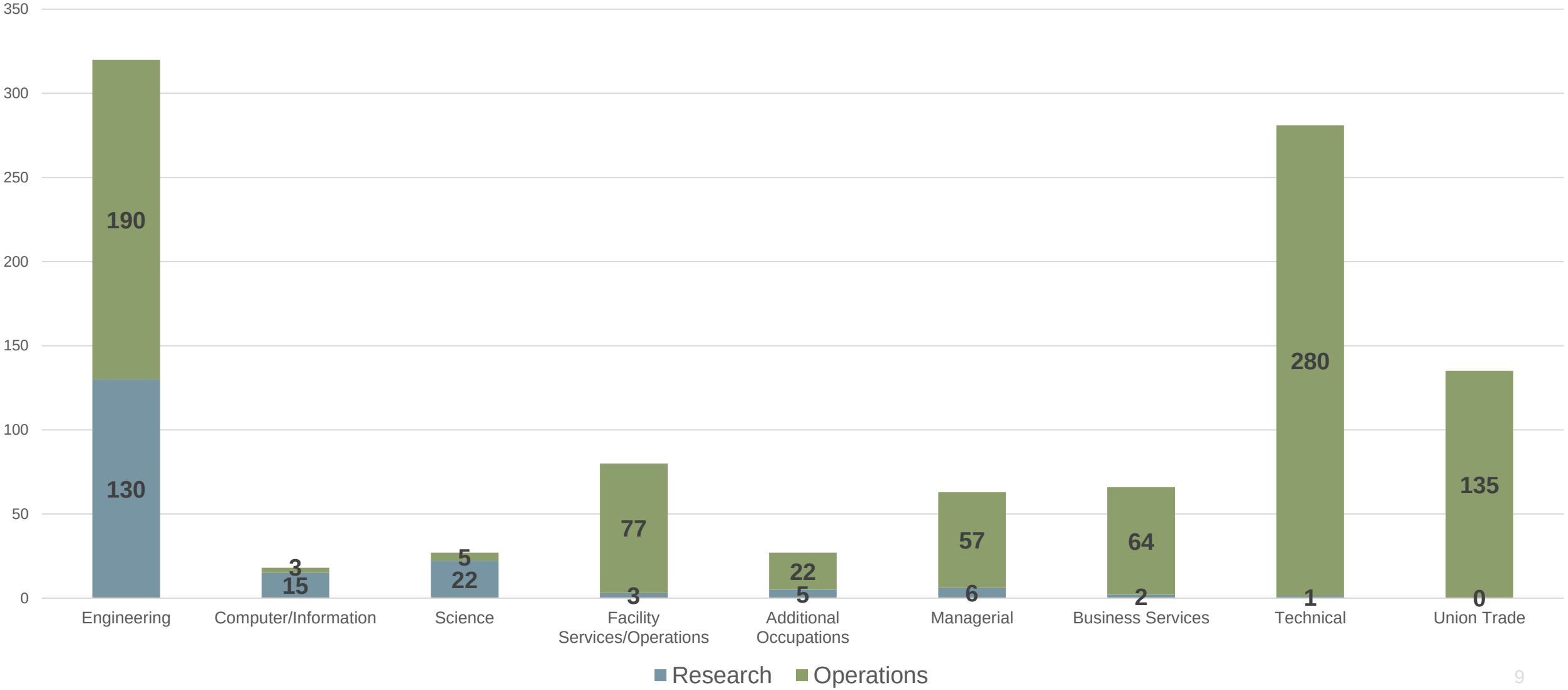
The Versatile Test Reactor staffing plan extends to FY25 and FY26. Adding another 46 projected openings in FY25 and 6 projected openings in FY26.

Work Discipline Groups

- For these purposes, occupations and projected hires will be categorized generally by work discipline:
  - Including:
    - Engineering
    - Computer Engineering/Information Systems
    - Science
    - Facility Services/Operations
    - Additional Occupations
    - Managerial
    - Business Services
    - Technician
    - Union Trade

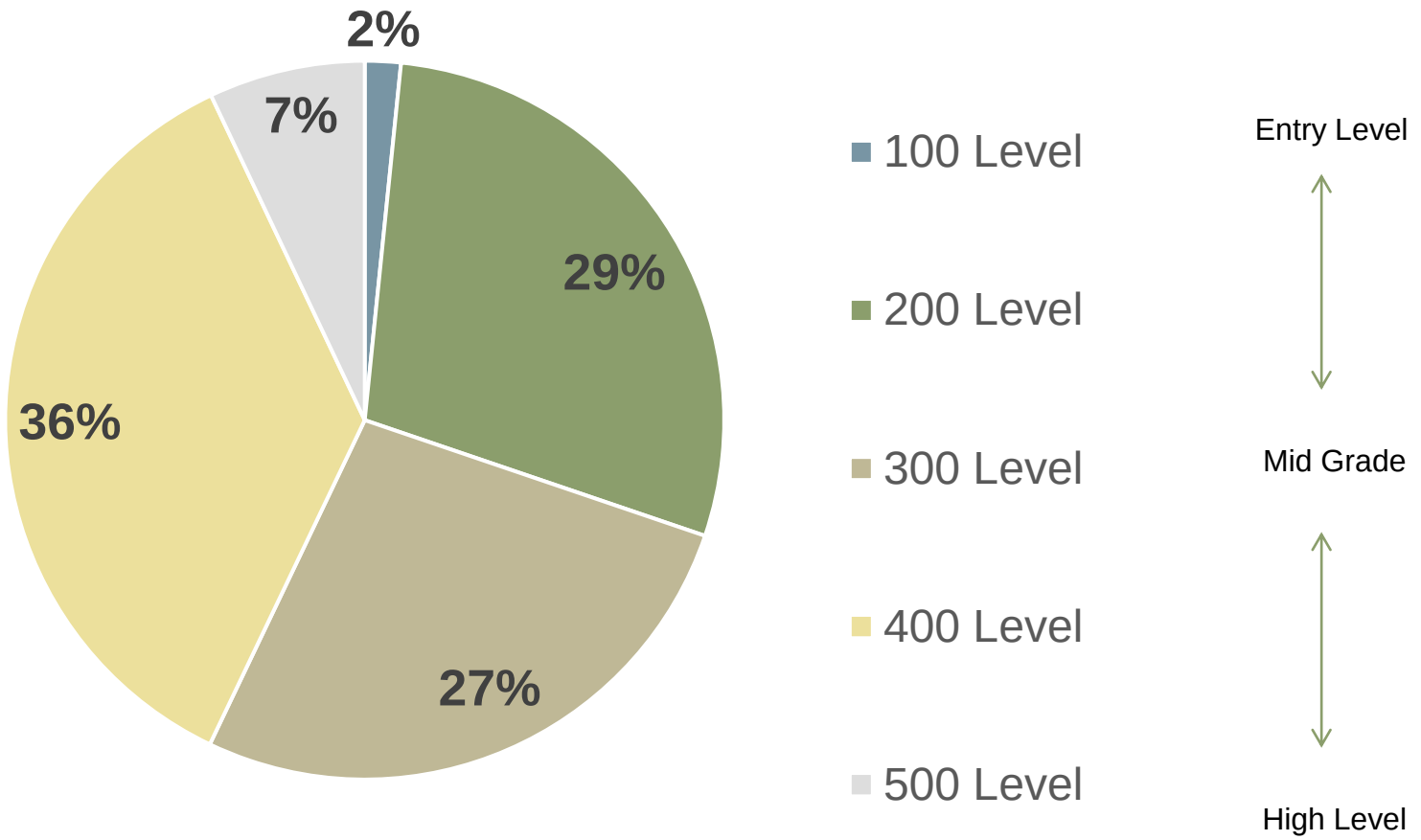
Projected Hires by Work Discipline

Research vs. Operations Focused Occupations



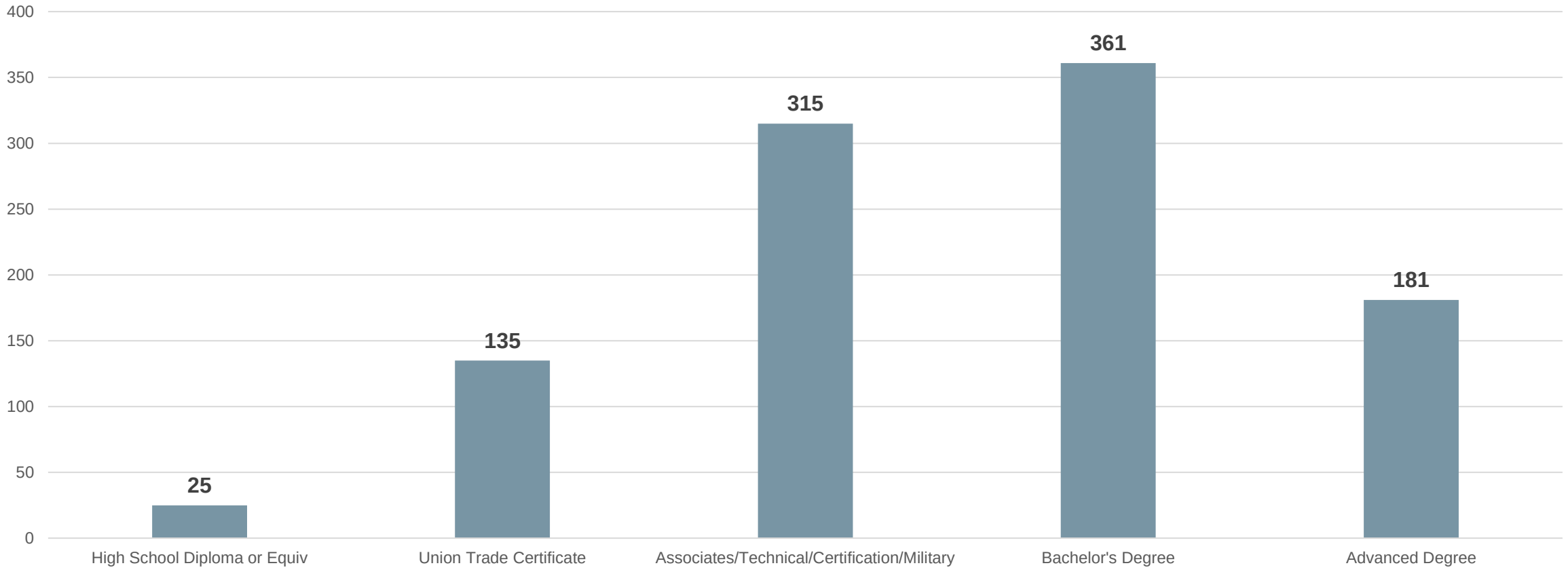
Projected Hires by Level

*These are maximum level postings, some postings will be multi-level; therefore, some postings will be filled below the maximum level.



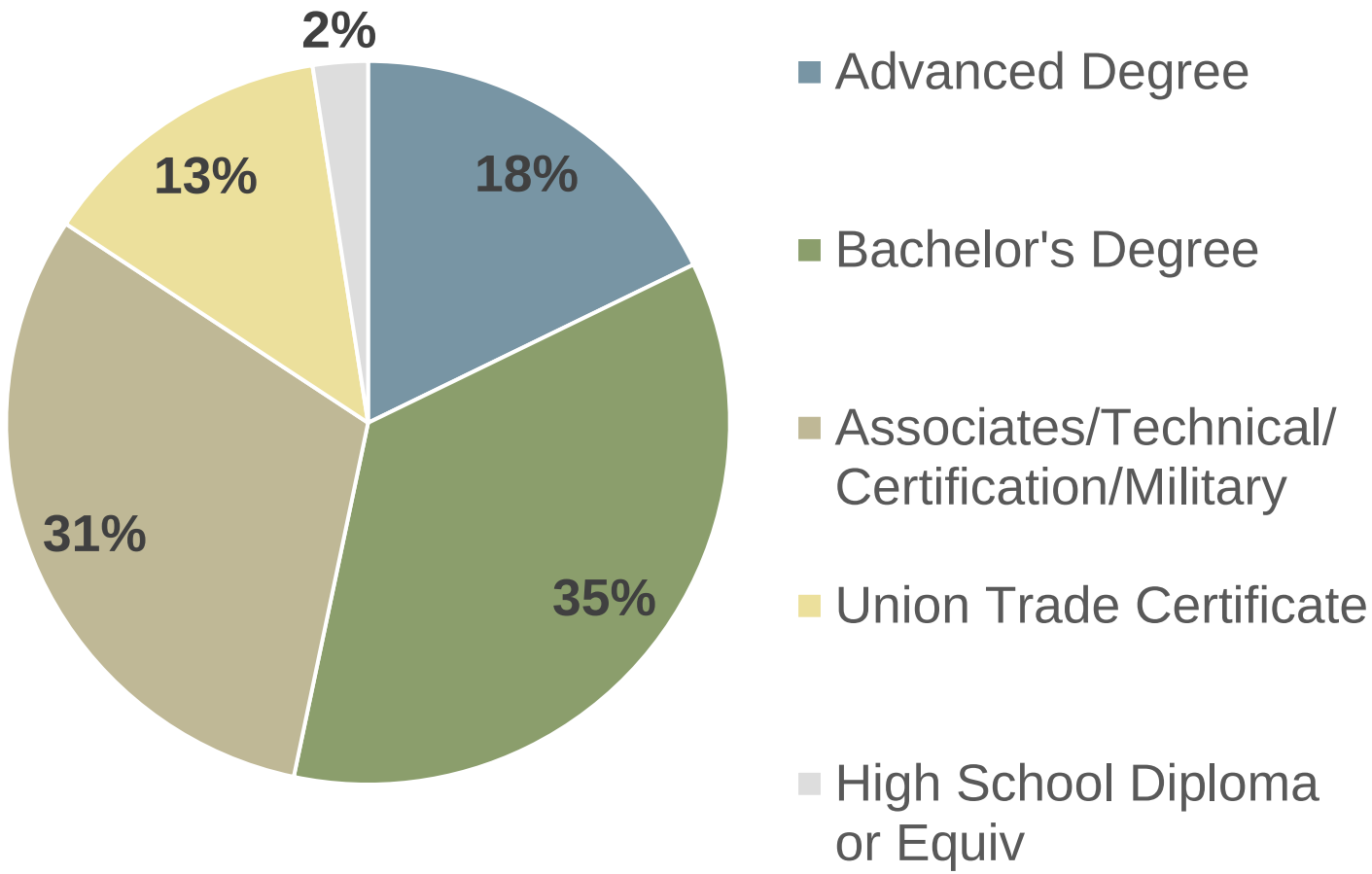
Minimum Entry Education for Nuclear Occupation Totals

All Nuclear Occupations, 2020-2024



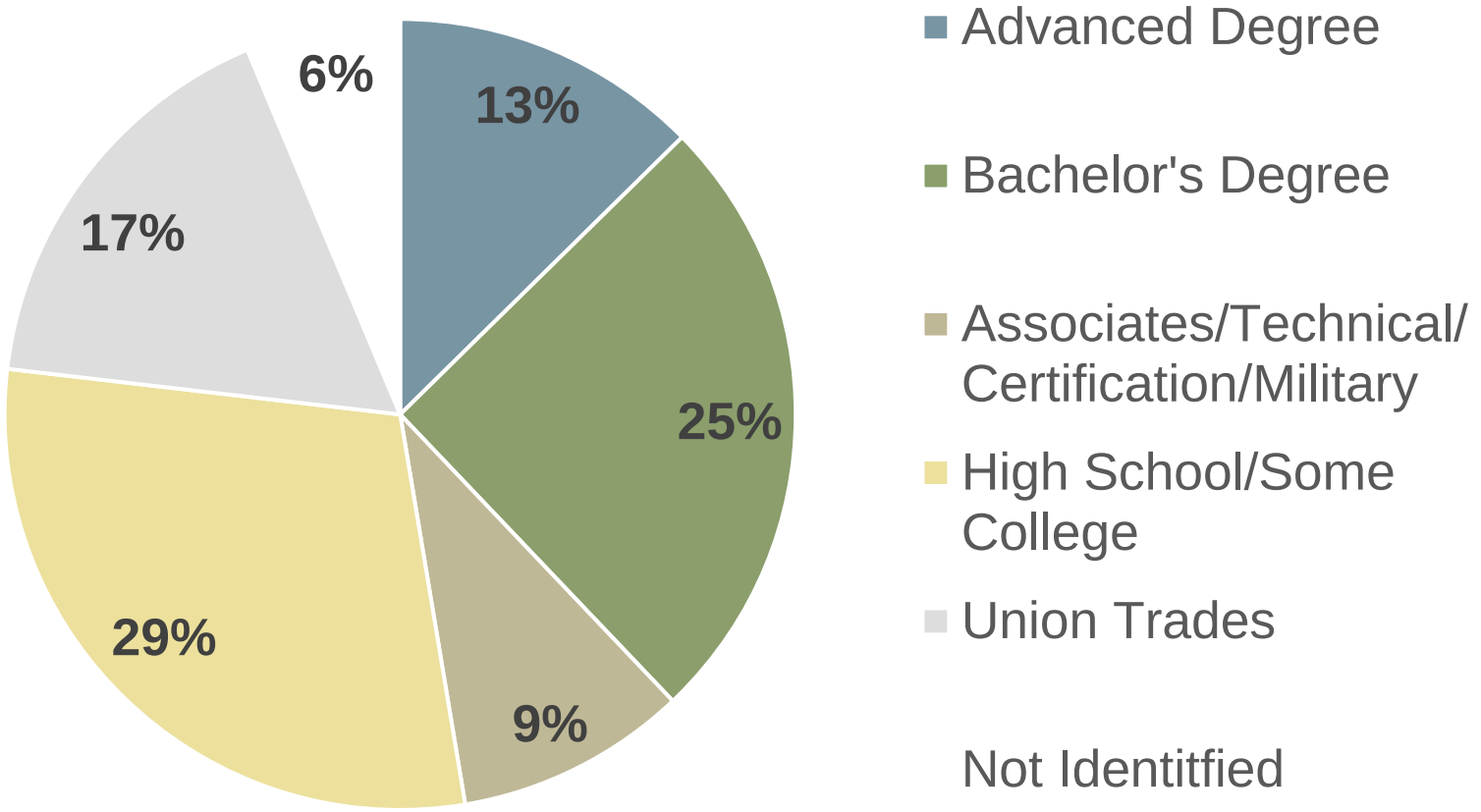
Minimum Entry Education for Nuclear Occupations by Percent

All Nuclear Occupations, 2020-2024



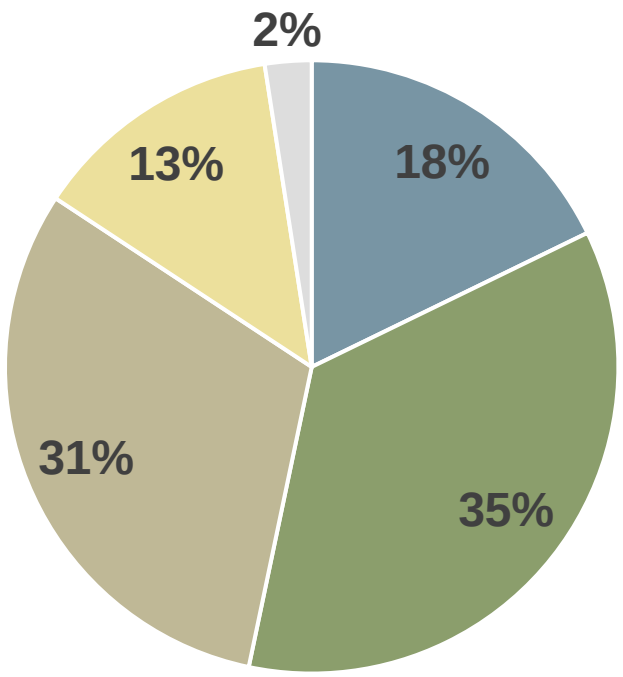
Majority Education Level for Nuclear Occupations by Percent

All Nuclear Occupations, Updated Q1 2020

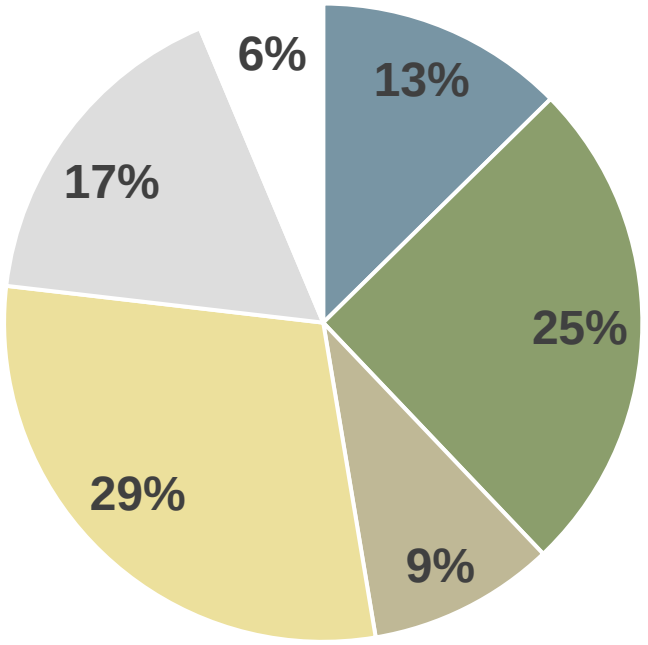


Side by Side

Incoming Minimum Education Requirement



Current Education Breakdown



- Advanced Degree
- Bachelor's Degree
- Associates/Technical/ Certification/Military
- High School/Some College
- Union Trades
- Not Identitfied

Engineering Occupations

All Degree Requiring Occupations

Total Projected Engineering Openings: 320

Occupation	Projected Openings
Nuclear Research Facility Engineer*	173
Nuclear Engineering*	60
Nuclear Safety Analysis*	19
Instrumentation & Controls*	17
Mechanical Engineering	15
Operations Engineer, General	7
Chemical Engineering*	5
Engineering Configuration Management	5
Materials Engineering*	5
Environmental Engineering*	4
Criticality Safety*	4
Electrical Engineering*	3
Power Engineering*	1
Systems Value Engineer*	1
Other Engineering*	1

* An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

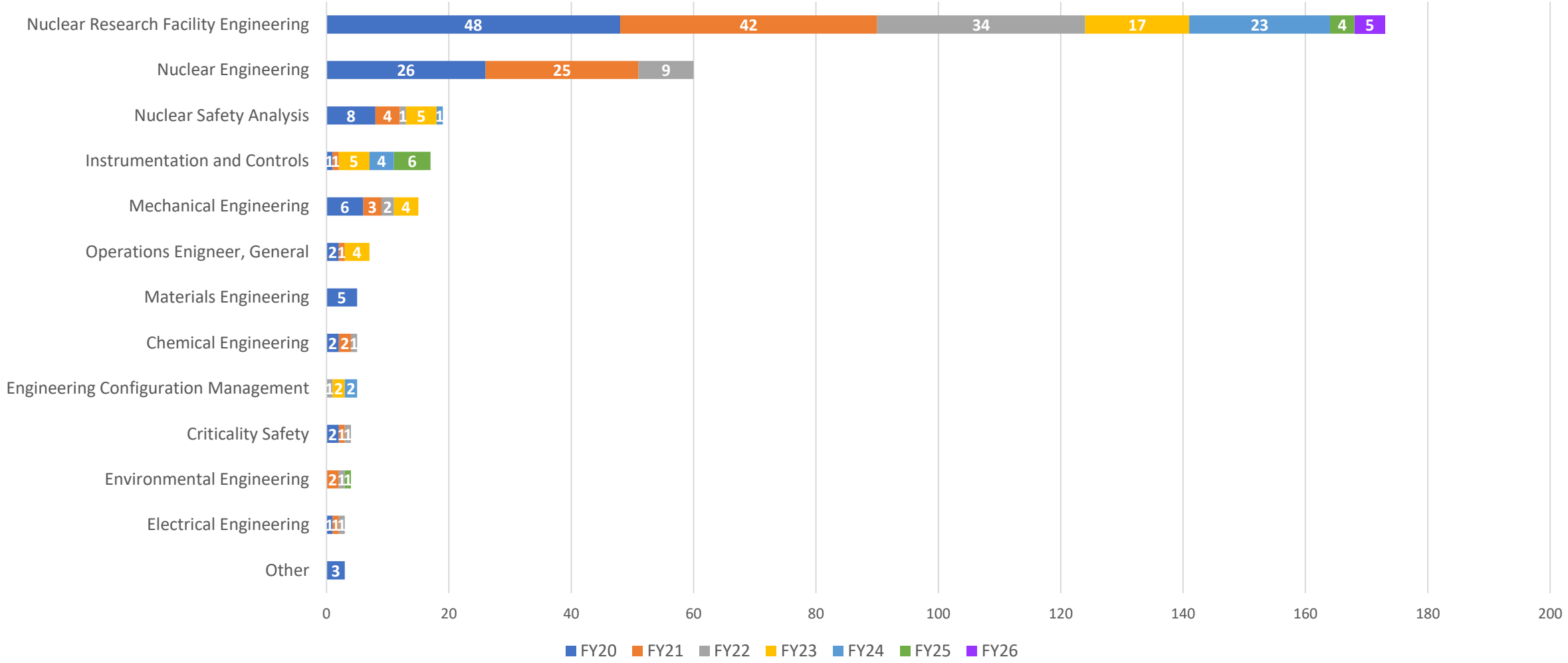
Engineering Occupation Discipline Breakdown:

Nuclear Research Facility Engineer	Mechanical Engineering	Nuclear Engineering	Electrical Engineering	Materials Engineering	Chemical Engineering	Other Degrees
% of Total Current *N= 211*	**35%**	**15%**	**11%**	**8%**	**5%**	**26%**
Estimated Count	**61**	**25**	**20**	**13**	**9**	**45**

Instrumentation & Controls	Electrical Engineering	Nuclear Engineering	Other Degrees
% of Total Current *N=13*	**54%**	**15%**	**31%**
Estimated Count	**9**	**3**	**5**

Nuclear Safety Analysis	Nuclear Engineering	Mechanical Enigneering	Chemical Engineering	Other Degrees
% of Total Current *N=25*	**40%**	**16%**	**12%**	**32%**
Estimated Count	**9**	**4**	**3**	**7**

Engineering Need by Year



Computer Engineering/Information Systems Occupations

All Degree Requiring Occupations

Total Projected Computer Engineering Openings: 18

Occupation	Projected Openings
Data Scientist*	6
High Performance Computing*	6
Visualization Engineering*	2
Software Analysis/ Integration Engineering	1
Computer Software Support Services	1
Other Computer Engineering	1
Network Engineering	1

* An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

Computer Occupation Discipline Breakdown:

Data Scientist	Computer Science	Information Technology	Statistics
% of Total Current *N=8*	**63%**	**26%**	**13%**
Estimated Count	**4**	**2**	**1**

High Performance Computing	Computer Science	Physics	Industrial Technology	Other Degrees
% of Total Current *N=11*	**27%**	**27%**	**27%**	**45%**
Estimated Count	**1**	**1**	**1**	**2**

Visualization Engineering	Computer Science	Environmental
% of Total Current *N=3*	**77%**	**33%**
Estimated Count	**3**	**1**

Science Occupations
All Degree Requiring Occupations

Total Projected Science Openings: 27

Occupation	Projected Openings
Computational Scientist*	14
Analytical Chemistry*	7
Chemical Sciences*	4
Statistics*	1
Physics	1

* An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

Facility Services/Operations Occupations

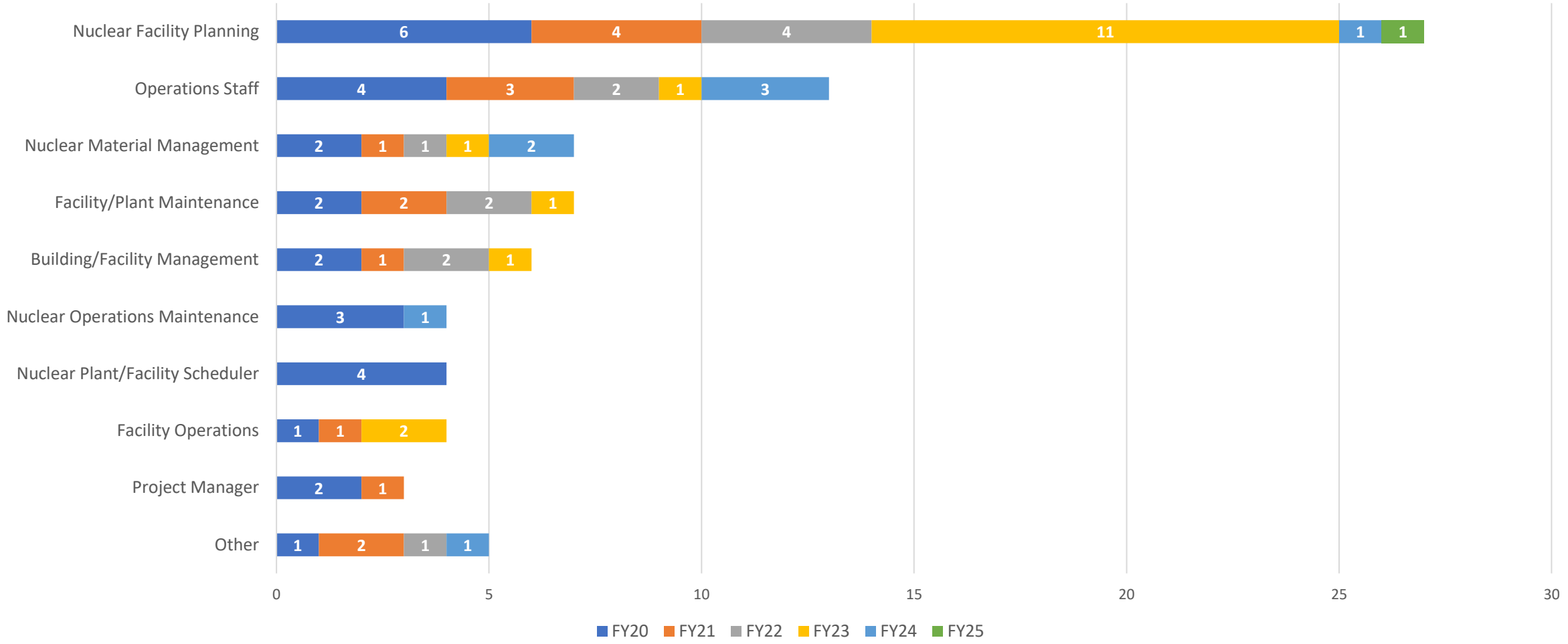
All Degree Requiring Occupations

Total Projected Facility Services/ Operations Openings: 80

Occupation	Projected Openings
Nuclear Facility Planning *(Bachelor's or Journeyman equivalent certification)*	27
Operations Staff Position	13
Facility/Plant Maintenance	7
Nuclear Material Management	7
Building/Facility Management	6
Facility Operations	4
Plant Scheduler	4
Nuclear Operations Maintenance Expeditor	4
Project Manager*	3
Program Manager	2
Emergency Preparedness/ Facility Protection	1
Project Scheduler	1
Project Controls	1

* An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

Facility Services/Operations Need by Year



Additional Occupations

All Degree Requiring Occupations

Total Projected Additional Technical Openings: 27

Occupation	Projected Openings
Probabilistic Risk Analysis (PRA)*	6
Other Technical Engineering Collaboration	5
Quality	5
Radiological Professional	3
Safety	2
Performance Assurance	2
Regulatory Compliance- Environmental	2
Human Factors*	1
Industrial Hygiene	1

*An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

Additional Occupation Discipline Breakdown:

Probabilistic Risk Analysis (PRA)*	Nuclear Engineering	Physics	Other Degrees
% of Total Current *N=13*	**54%**	**23%**	**23%**
Estimated Count	**3**	**1**	**1**

Quality	Industrial Technology	Engineering Related	General Study	Other Degrees
% of Total Current *N=36*	**22%**	**22%**	**22%**	**36%**
Estimated Count	**1**	**1**	**1**	**2**

Managerial Occupations

Wide Variety of Education Requirements

Total Projected Managerial Openings: 63

Occupation	Projected Openings
Operations Manager	33
Science/Engineering Manager*	12
Foreman, Crafts	7
Foreman, Operations	5
Administrative Services Manager	2
Operations Supervisor	2
Facility Support Services Manager	1
Facility Support Services Supervisor	1

* An Advanced Degree is necessary in some cases, especially in research-focused roles, and may be helpful to be considered among a competitive talent pool.

Business Support Services/Admin Occupations

Wide Variety of Education Requirements

Total Projected Business Support Openings: 66

Occupation	Projected Openings
Nuclear Facility Training (Associate Degree Level Req)	19
Administrative Assistant/ Office Coordinator	17
Technical Writing/Editing	8
Other Administrative Support	7
Record Management/ Document Control	5
Procurement	4
Training	4
Electronic Publications	1
Work Order Tracking & Scheduling	1

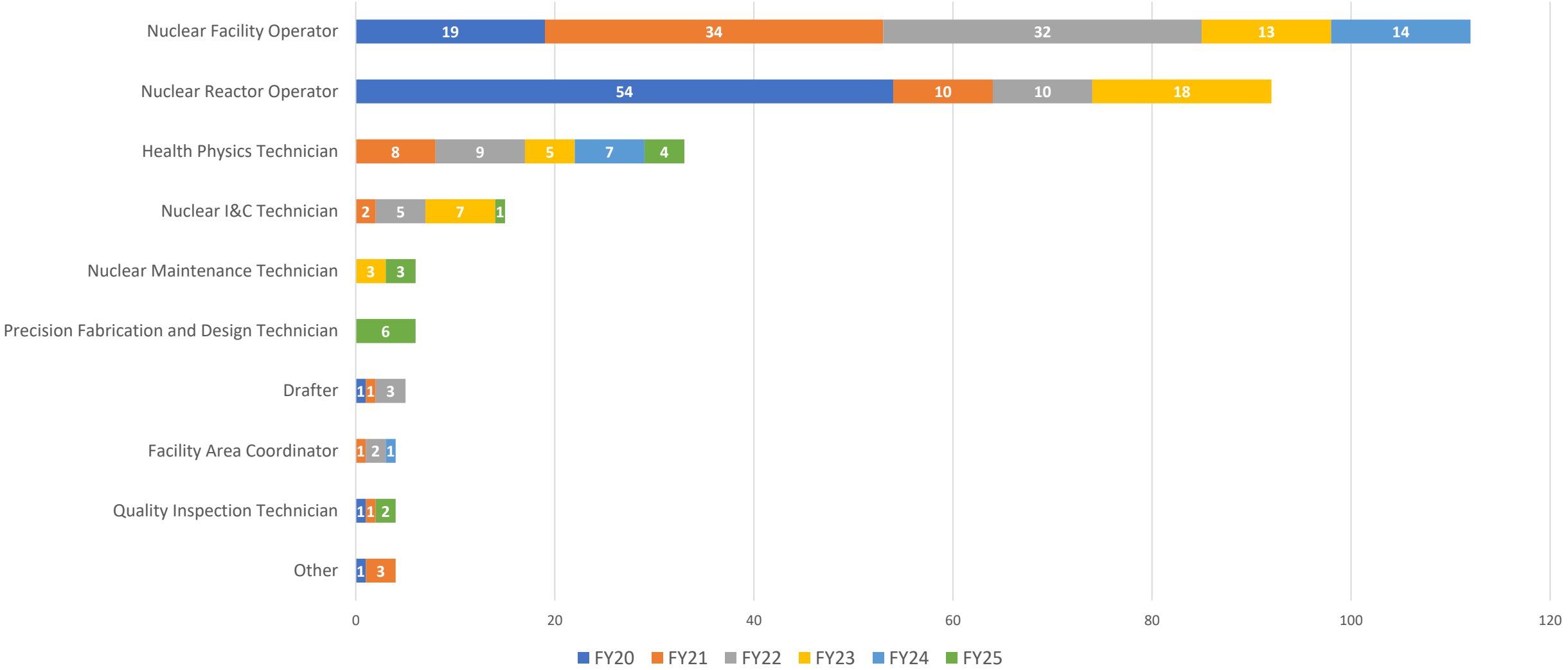
Technician Occupations *(Non-Exempt, Non-Represented)*

All Associate Degree (or Equivalent Experience) Requiring Occupations

Total Projected Technician Openings: 281

Occupation	Projected Openings
Nuclear Facility Operator	112
Nuclear Reactor Operator	92
Health Physics Technician	33
Nuclear Instrumentation/Calibration Technician	15
Nuclear Maintenance Technician	6
Precision Fabrication & Design Technician	6
Drafter	5
Facility Area Coordinator	4
Quality Inspection Technician	4
Laboratory Technician	1
Other Technicians and Operators	1
Research & Development Technician	1
Warehousing & Distribution	1

Technician Need by Year



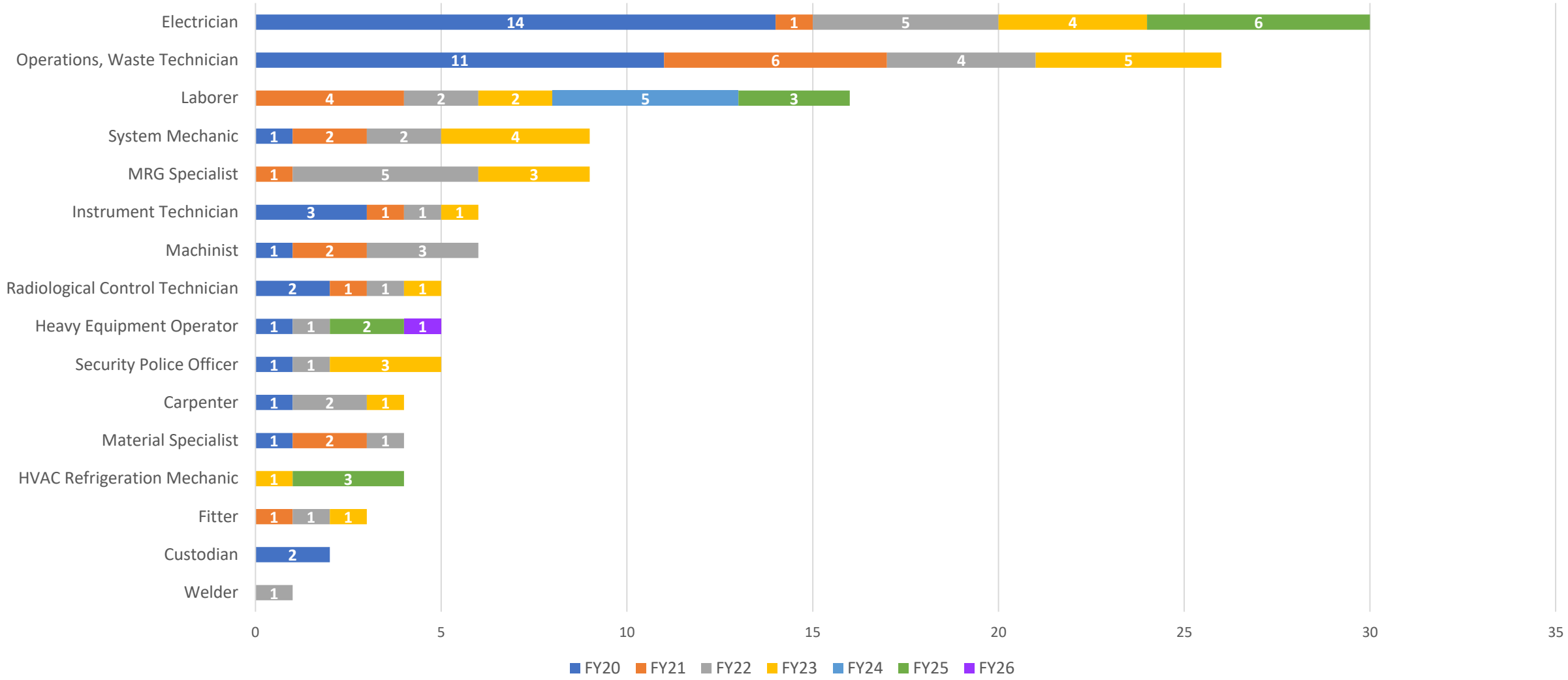
Union Trade Occupations

Union Requirement Standards

Total Projected Union Trade Openings: 135

Occupation	Projected Openings
Electrician	30
Operations, Waste Technician	26
Laborer	16
System Mechanic	9
MRG Specialist	9
Instrument Technician	6
Machinist	6
Radiological Control Technician	5
Heavy Equipment Operator	5
Security Police Operator II (SPO II)	5
Carpenter	4
Material Specialist	4
HVAC Refrigeration Mechanic	4
Fitter	3
Custodian	2
Welder	1

Union Trade Needs by Year

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