

# Process Industries Converting Resources into Alaska's Future

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Alaska Process Industry Careers  
Consortium (APICC)  
**2006 Presentation**



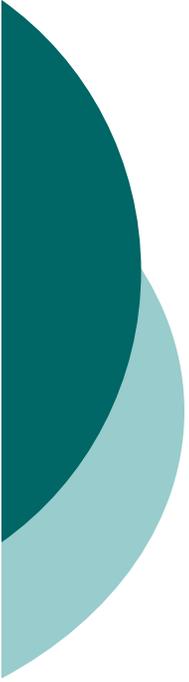


## What is a "process industry"?

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Process industries convert one material into a new material or product that may be finished or used by another process industry.

Examples include: next slide



# “Process Industries”

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- Oil/Gas Production
- Mining
- Power Generation
- Complex Food Processing
- Timber Processing
- Manufacturing
- Water & Wastewater Processing
- Chemicals & Refining
- Pharmaceutical

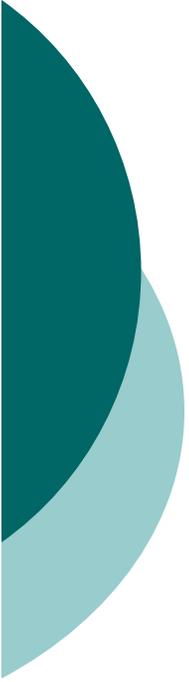


# Where are process industry jobs?

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Across the state in every community:

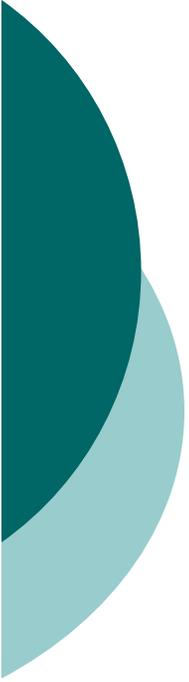
- Cities/Villages
  - Power, water, wastewater
- Mines around the state
  - Mining, Power, Water, Wastewater, Manufacturing
- Cook Inlet, North Slope
  - Power, water, wastewater, chemicals & refining
- Remote fish and timber processing plants
  - Food processing, power, water...



# Short term or Long term Jobs

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- **Career oriented jobs**
  - year round employment – power, water/wastewater
  - projects and year round – mining, oil/gas
- **Cyclical or Seasonal jobs**
  - Fish processing, Timber processing



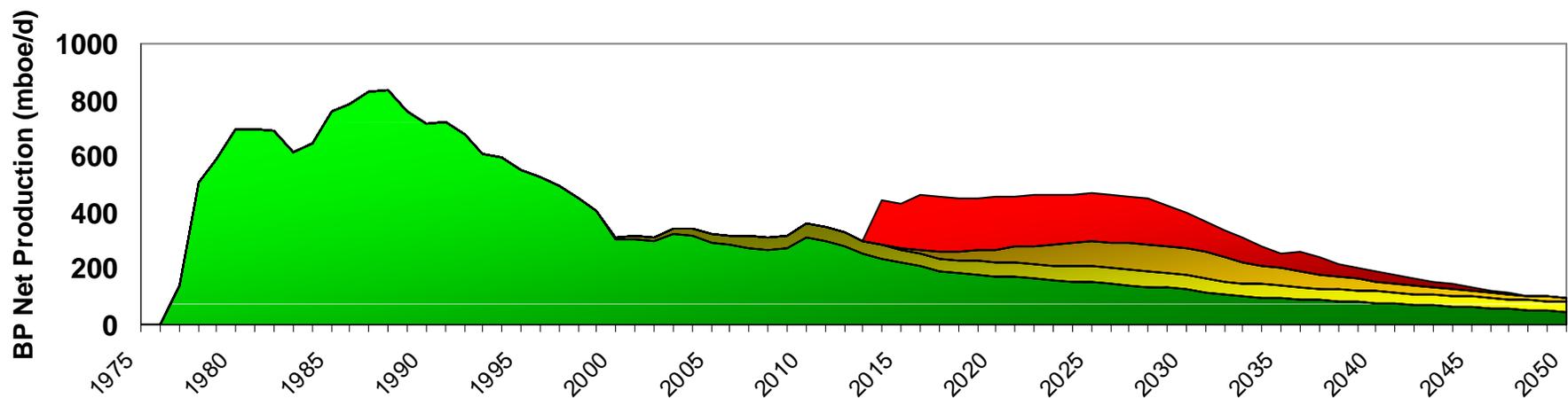
# Just Mining or Oil/Gas?

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- Process industry jobs have common, transferable skills.
- Preparation for jobs in one process industry builds life long career experience that is valued in other process industries...
  - operations, management, projects, electrical/automation, maintenance, power generation, water/wastewater processing...

## Jobs vs. Careers

- Gas Pipeline, Mining – 5 year construction project or 15 year industry development with 50+ year production?
- Direct Jobs (Plan, Construct, Operate, Maint.)
- Legacy Jobs (gas line and spurs, suppliers)
- Induced Jobs – Manufacturing, new businesses using gas...





# Alaska Gas Pipeline Route



# *Alaska Gas Pipeline and TAPS*



Alaska Gas Pipeline

TAPS



# *Alaska Gas Pipeline and TAPS*



Cut-Away  
View

Alaska Gas  
Pipeline

TAPS

# What's In It For Me?

## Project Jobs



### Crafts

- Carpenters
- Drill Rig Operators
- Electricians
- Foremen
- Helpers – All Crafts
- Instrument Techs.
- Insulators
- Ironworkers
- Laborers
- Loggers
- Machinists
- Mill Wrights
- Painters
- Pipe Coaters
- Pipefitters
- Sandblasters
- Scaffolders
- Sheet Metal Worker
- Welders
- Welding Technician

### Material Handling

- Expeditors
- Clerks
- Material Inspectors
- Warehousemen
- Fork Lift Operators



### Field Inspectors

- Civil
- Coating
- Electrical
- Environmental
- Instrumentation
- Lifting
- Mechanical
- Safety
- Telecom
- Ultrasonic
- Welding
- X-Ray



### Surveyors

- Party Chiefs
- Survey Crews

### Safety

- Consultants
- Inspectors
- Flagmen

### Environmental

- Air Specialists
- Archaeologist
- Biologists
- Geotechnical Engineers
- Hydrologists
- Water Specialists

### Equipment Operators

- Backhoe Operators
- Crane Operators
- Dozer Operators
- Fork Lift Operators
- Mechanics
- Oilers
- Rigger Helpers
- Riggers
- Side Boom Operators
- Trencher Operators
- Truck Drivers

### Camps / Catering

- Cooks
- Maintenance
- Medical
- Stewards
- Supervisor



### Administrative

- Accountants
- Admin. Aids
- Auditors
- Clerks
- Cost Control
- Document Control
- HR
- IT Systems
- Payroll
- Secretary



### Logistics

- Airplane Pilots
- Barge Operators
- Bus Drivers
- Cleaners
- Coordinators
- Deckhands
- Dispatchers
- Flight Attendants
- Freight Handlers
- Fueling Operators
- Helicopter Pilots
- Railroad Engineers
- Stevedores
- Truck Drivers
- Water Haulers

### Office & Field Engr.

- Buyers
- Civil Engineers
- Computer Specialists
- Contracts Specialists
- Control System Engineers
- Designers
- Draftsmen
- Electrical Engineers
- Expeditors
- GIS Specialists
- Lifting Specialists
- Mappers
- Mechanical Engineers
- Metallurgical Engineers.
- Procurement Specialists
- Project Engineers
- Project Managers
- Quality Engineers
- Schedulers
- Telecom Engineers



### Security

- Guards
- Police
- State Troopers
- Watchmen
- Wildlife Control

# Opportunities for Hundreds of Alaskan Businesses

## Contractors

- Air Transport (Airplane, Helicopter)
- Barges
- Camps
- Catering
- Civil
- Coatings
- Computer Systems
- Commissioning
- Control Systems
- Electrical
- Engineering
- Environmental
- Fabricators
- Finance and Banking
- Fuel Haulers
- Horizontal Directional Drilling
- Hot Shot Deliveries
- Inspection
- Insulation
- Lifting (Crane, etc.)
- Logistics
- Manpower Agencies
- Mechanical
- Media Companies
- Pipe Fabrication
- Pipeline
- Pipeline Pigging
- Railroad Transport
- Safety
- Scaffolding
- Security
- Ships, Barges and Tugs
- Surveyors
- Telecommunications
- Testing
- Training
- Trenching
- Trucking
- Water Transport

## Suppliers

- Asphalt
- Civil Materials
- Clothing
- Coating Materials
- Communication Equipment
- Concrete
- Consumables
- Control Sys Equip / Materials
- Electrical Equip / Materials
- Food and Drink
- Fuel and Lubes
- Geotechnical Fabrics
- Gravel
- Instrumentation
- Insulation Materials
- Mechanical Equip./Mat
- Misc. Materials (Timber, etc.)
- Office Supplies
- Piping Materials
- Pumps
- Pressure Vessels
- Rig Mats
- Rigging Equip. / Materials
- Safety Equipment
- Scaffolding Materials
- Structural Materials
- Tankage
- Vehicles (Cars, Trucks, ATVs)
- Temp. Housing / Motels / RVs



# Core Oil & Gas Jobs / Careers

- Process Operators
- Maintenance Technicians
  - Electricians
  - Instrumentation
  - Mechanical
- Multi-skilled Technicians
- Engineers & Scientists
- Project Managers
- Drafters/Designers
- HSE Specialists
- Warehouse/Materials Handlers



## Professionals:

- Managers
- Engineers
- Geologists
- Metallurgists
- Environmental scientists
- Human Resources professionals
- Health & Safety professionals
- Logistics professionals



## Technical Specialists:

- Surveyors
- Drafters
- Computer technicians
- Instrumentation technologists
- Lab technicians
- Environmental technicians
- Geological technicians
- Health & Safety technicians
- Industrial hygienists



## Mine & Mill Workers:

- Millwrights
- Electricians
- Mechanics
- Plumbers
- Maintenance planners
- Metallurgical samplers
- Machinists
- Welders
- Industrial mechanics
- Truck drivers
- Shovel operators
- Loader operators
- Dozer operators
- Drillers
- Laborers



# Now

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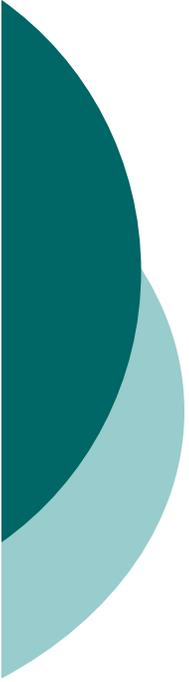
- **Oil & Gas Production and transportation**
- **Refining & Chemicals**
- **Power Generation and Transmission**
- **Water / Waste-Water Treatment Utilities**
- **Mining: Pogo, Donlin, Red Dog, Ft. Knox Greens Creek**



# Future



- Gas Pipeline
- North Slope Development of Oil & Gas
- Cook Inlet Oil & Gas
- Mining – Kensington, Rock Creek, NSB, NWA, Pebble & others



# Process Industries & Demand

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- Oil and gas production and refining ↑
- Mining ↑
- Power generation ↑
- Water and wastewater treatment ↑
- Manufactured forest products ↔
- Food processing ↔
- Chemical plants – ?Alaska
- Pharmaceutical plants. – ?Alaska

# INDUSTRY - OCCUPATIONS

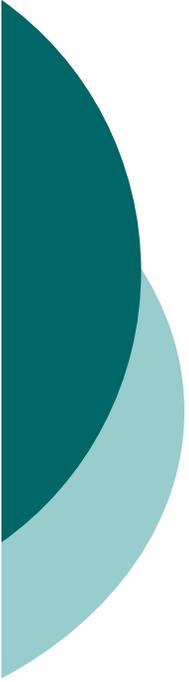
## Occupation With Highest Level of Concern

### CONSTRUCTION

Mechanic
Mechanic, Heavy Equipment
Engineer
Welder
Manager / Supervisor, Safety
Instrumentation/Process Automation Tech.
Mechanic, Diesel Engines
Environmental Technician
Pipe Fitter
Health & Safety Specialist

### OPERATIONS

Instrumentation/Process Automation Tech.
Engineer
Mechanic
Environmental Technician
Mechanic, Heavy Equipment
Manager / Supervisor, Safety
Facilities Maintenance
Electrician
Manager, General/Operations
Health & Safety Specialist



# “Perfect Storm”

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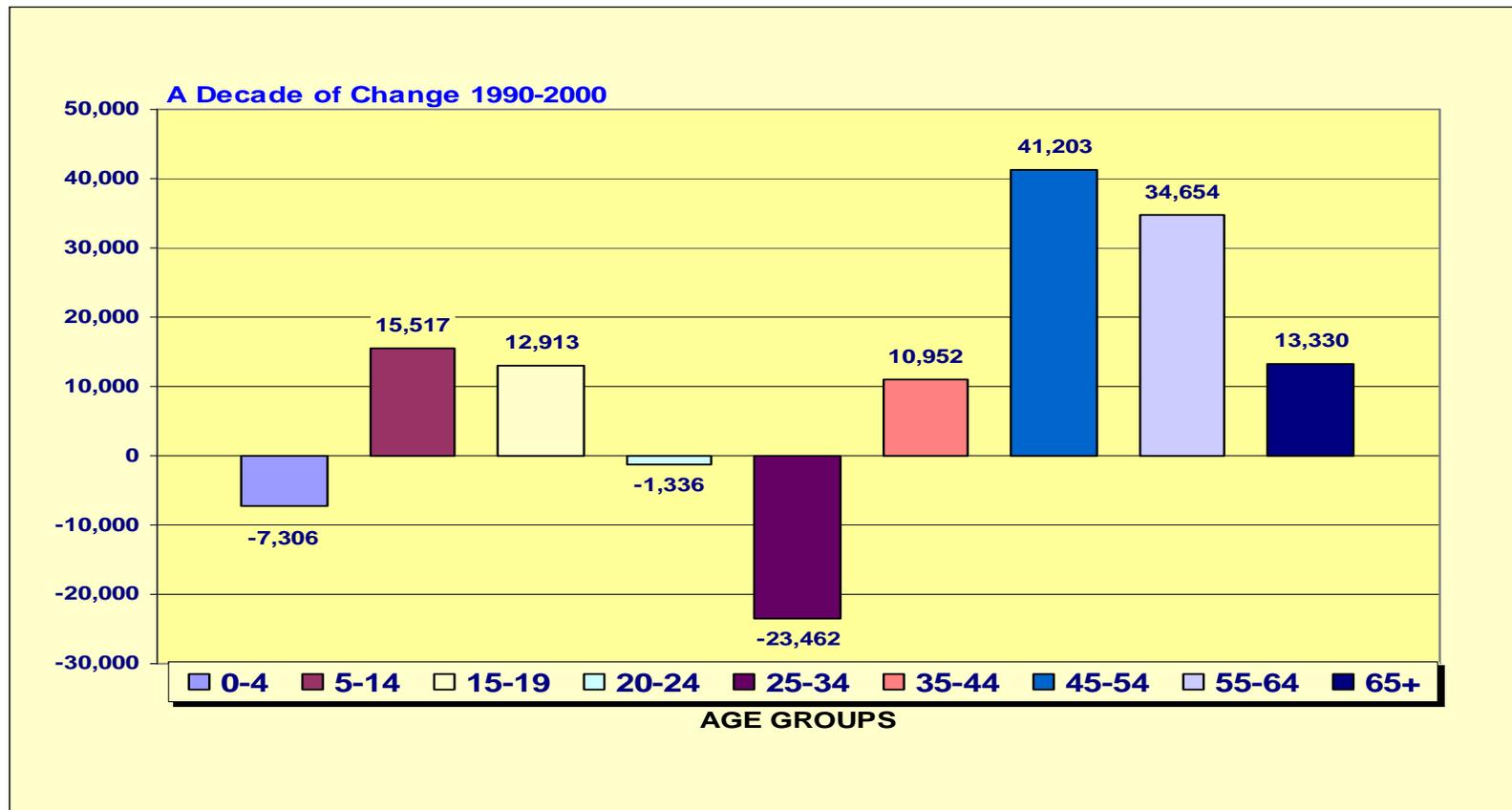
## ○ Supply

- Fewer qualified new workers entering workforce
- Fewer out of state workers available and willing to stay
- Aging workforce
- Reduced Career & Technical Education

## ○ Demand

- Strong economic outlook for state
- Major projects with initial and legacy jobs
- Higher “bar” for employment

# Fewer Babies and Younger Adults More Boomers and Others



## *Multi Year vs. Multi Generations*

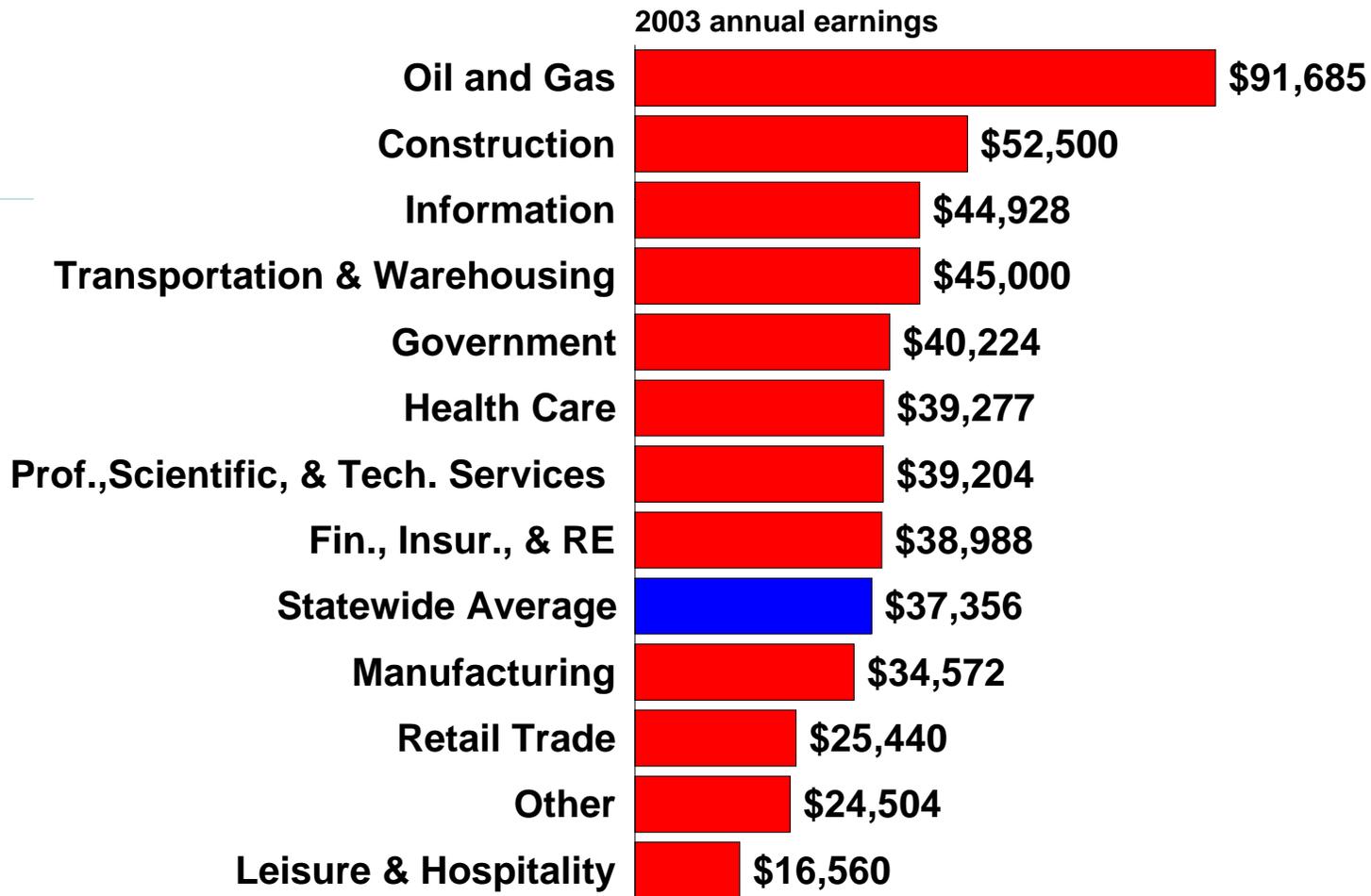
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- The gas line construction workforce is just learning to read and write. Their children will have job opportunities!
- The gas line workforce and mining development work force is already at WORK – design, planning, surveying, exploration, permitting, construction...

***Jobs for today –  
Careers for generations***



# How Alaska's Average Annual Earnings Stack Up



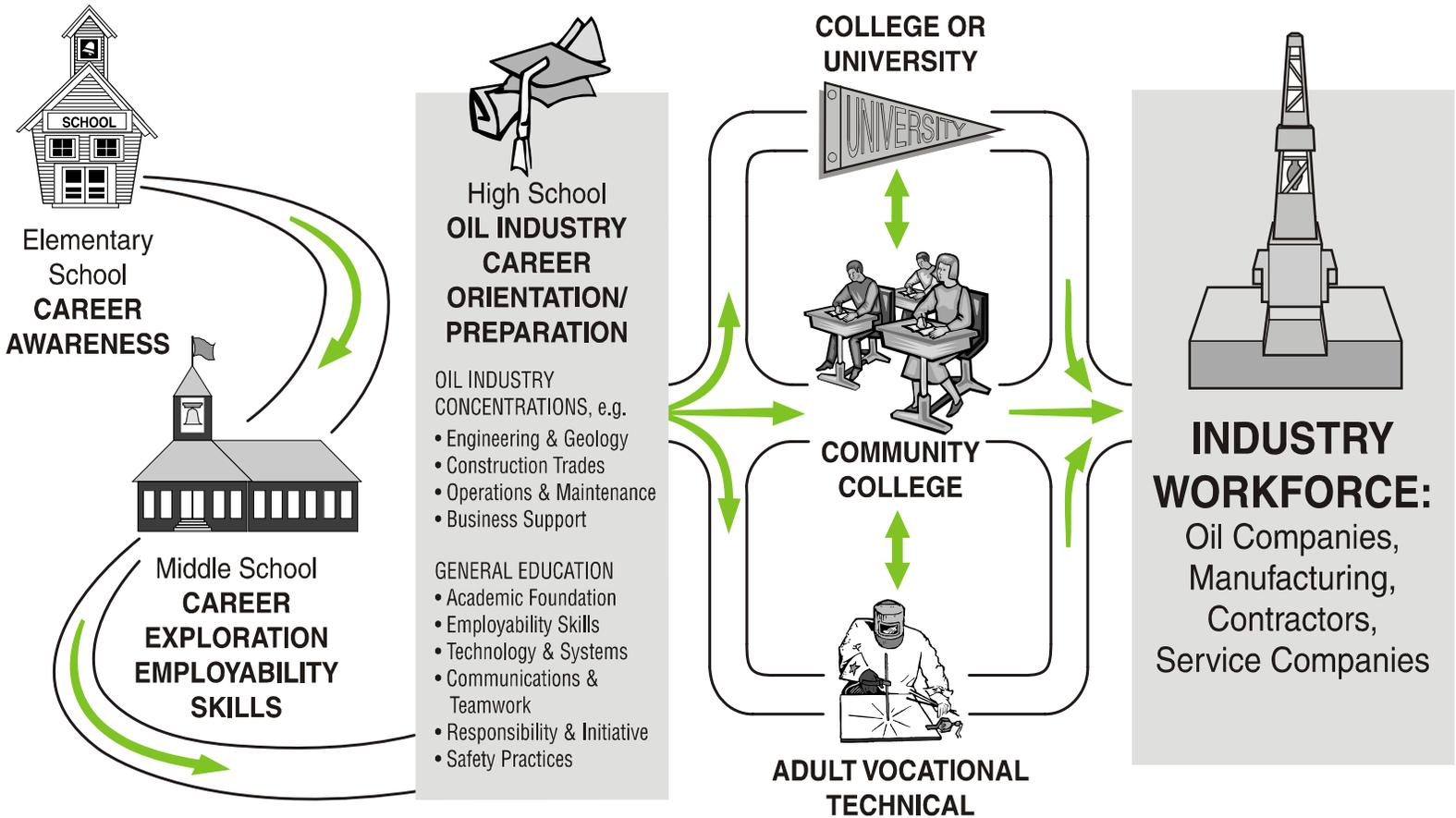
# Finding Jobs

- Preparation
  - High School & Post Secondary
- Entry Level jobs
  - Gaining experience
  - Contractors and service companies
  - Direct hire by major producers
- Advanced jobs –
  - Additional training, job advancement



# Career Pathway Example

## CAREER PATHWAYS FOR THE OIL INDUSTRY





## Competencies:

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- Productive Attitude & Personal Qualities
- People Skills
- Punctuality & Attendance
- Critical Thinking & Problem Solving
- Time and Resource Allocation
- Business Basics
- Info Analysis / Technology & Communication
- **SAFETY CONSCIOUS**

# Important Skills & Knowledge



## “Applied Academics”

- Math
- Science
- Communication

## Relevant Workplace Skills

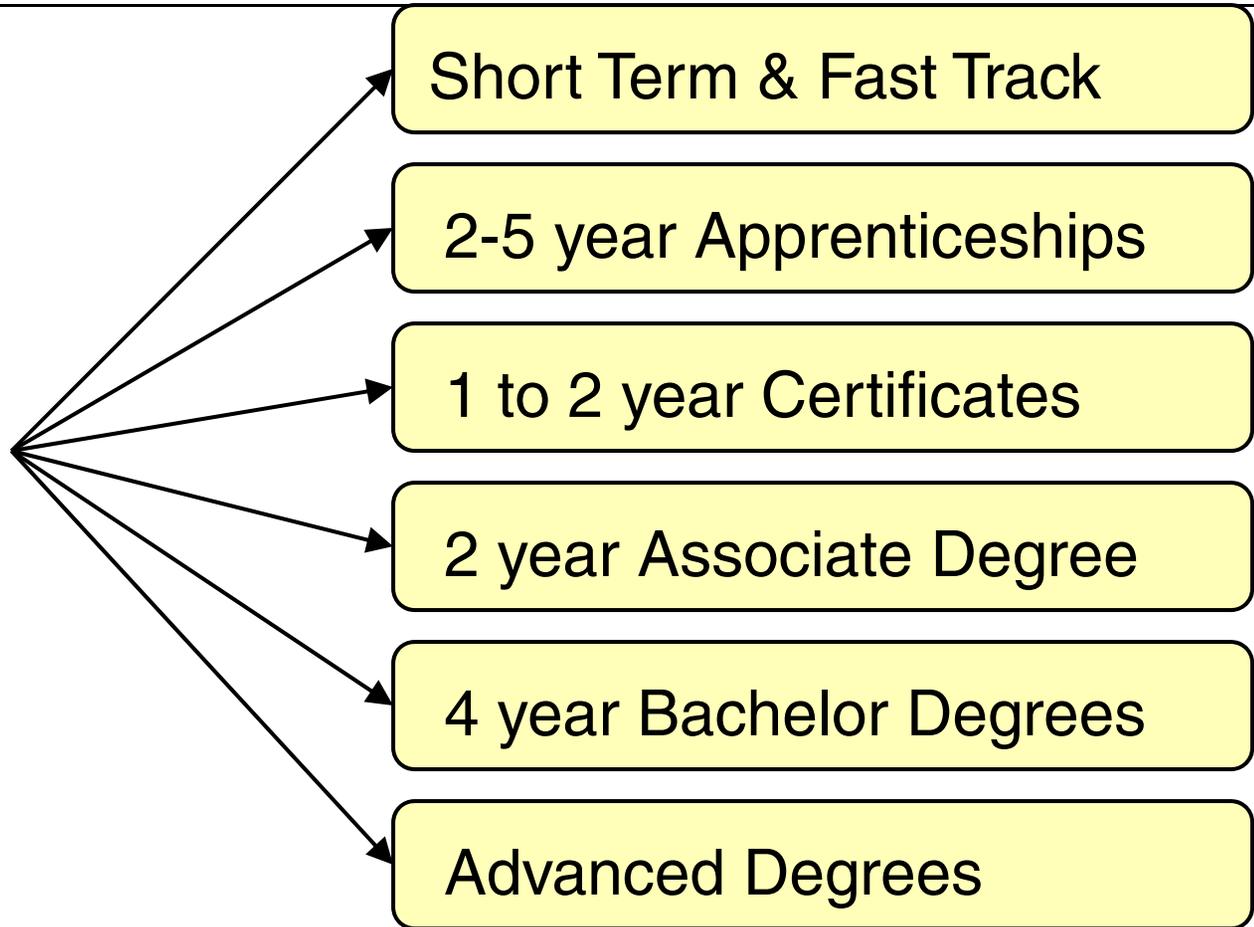
- Tools & Craft
- Computers



# Preparation Programs



High School  
Technical  
Preparation



# Short Term & Fast Track

- Commercial Driving
- Computer Technicians
  - Vendor Certification
- Safety
  - Entry level jobs
  - NANA Training, MAPTS, NSTC
- Oil & Gas Entry Level
  - Roustabout
  - MAPTS
- Mining Equipment
  - MAPTS (Soldotna)
  - DMTC (Delta Junction)
- Fast Track (Fairbanks)
  - Diesel & Heavy Equipment
  - Drafting
  - Power Generation
  - Safety, Health & Environmental Awareness
  - Instrumentation
- Regional Learning Centers

# Apprenticeships

- **Boilermakers**
- **Carpenters**
- **Electrical Workers**
- **Ironworkers**
- **Laborers**
- **Operating Engineers**
- **Plumbers, Pipefitters, and Steamfitters**
- **Sheet Metal Workers**



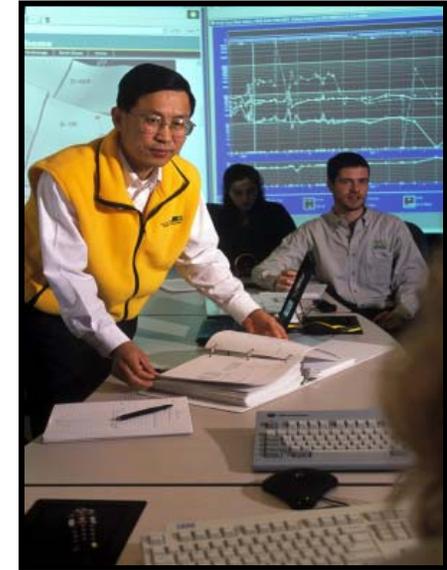
# *Certificates in 1 to 2 years*

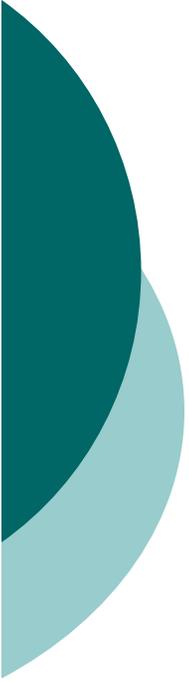
- Environmental Technology - Distance/Local
- Industrial Electricity - (AVTEC)
- Power Plant Operation (AVTEC)
- Industrial Technology - Safety Management, Electrical Power Generation, Oil Spill
- Mechanical Technology
- Petroleum Technology
- Welding & Materials Technology



# 2 year Associate Degrees

- Environmental Technology (UAS)
  - Distance / Local
- Industrial Process Instrumentation (Kenai)
- Industrial Technology
  - Electrical Power Generation
  - Safety Management
  - Oil Spill Response
  - Millwright (Valdez)
- Logistics AAS (Anchorage)
- Process Technology AAS (Anchorage, Kenai & Fairbanks)
- Occupational Health & Safety (Anchorage)





# Process Technology Program

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- College Algebra
- Chemistry
- Physics
- Composition/Writing Skills
- Speech/Oral Presentations
- Computer Literacy
- Sociology
- Fitness and Health
- Applied Electives
- Introduction to Process Technology
- Health, Safety, and Environmental Issues in the Process Industry
- Process Technology I: Equipment
- Process Technology II: Systems
- Process Technology III: Operations
- Process Instrumentation I
- Process Instrumentation II
- Process Troubleshooting
- Process Quality

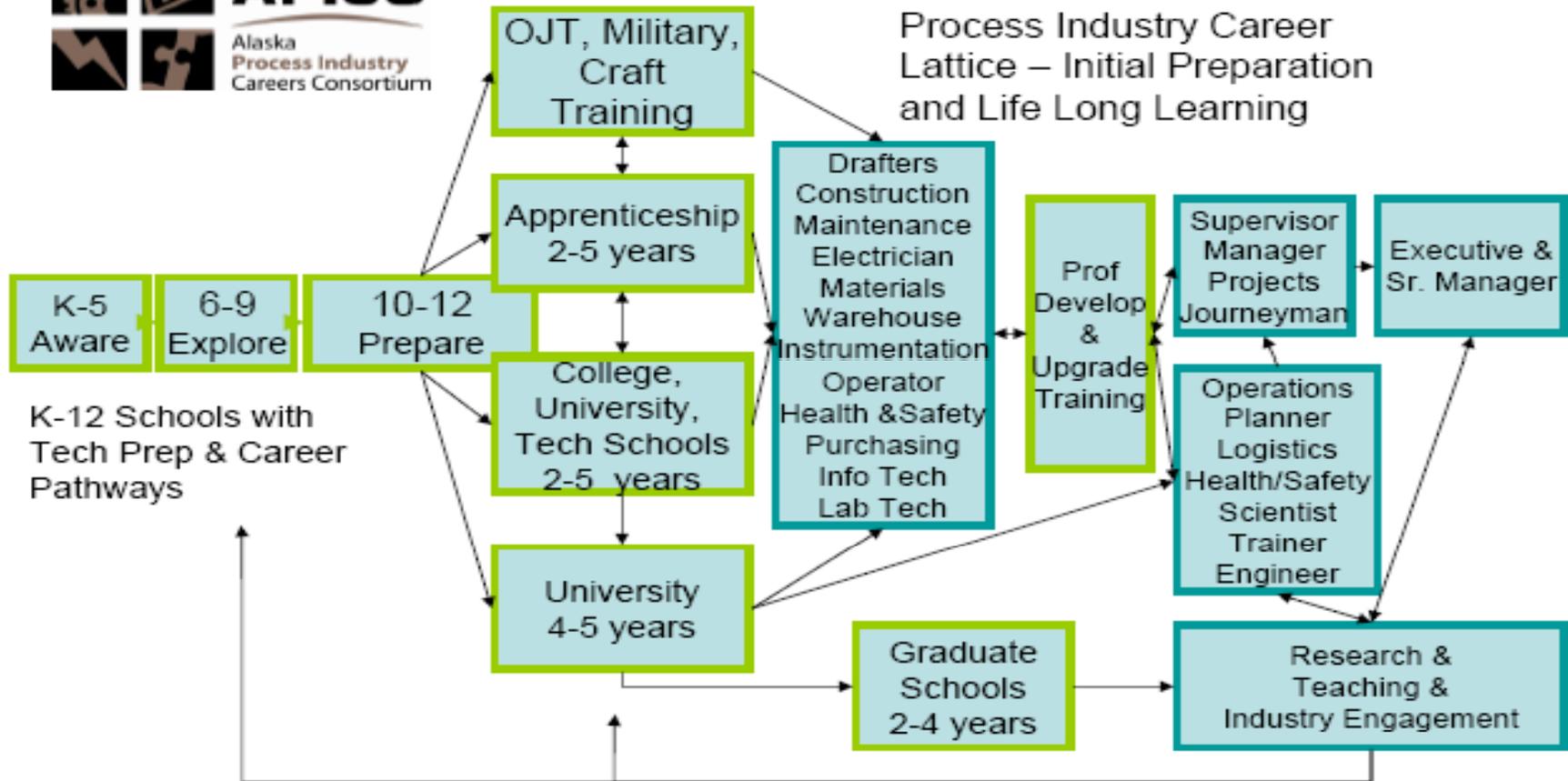


## 4 year Bachelor Degrees

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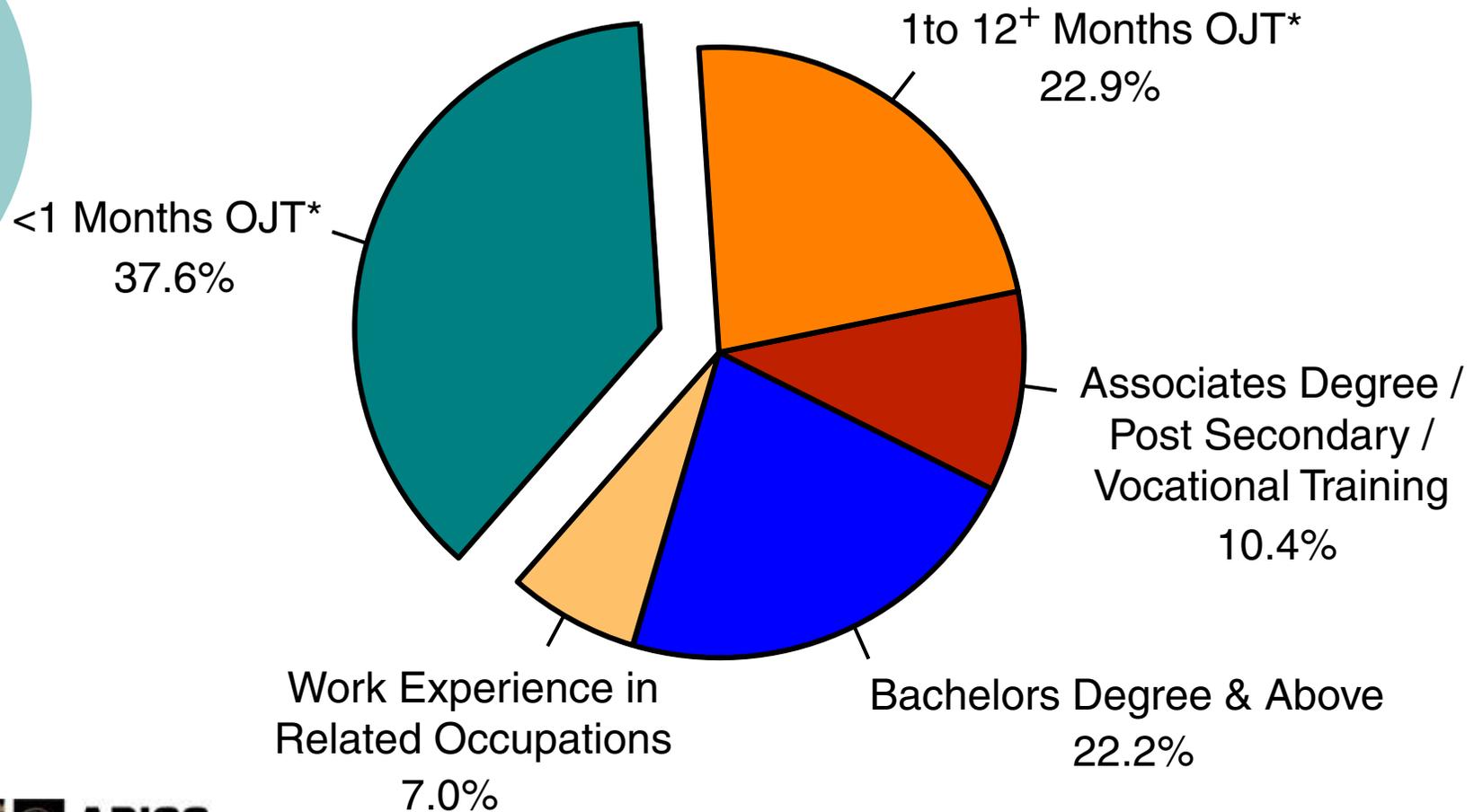
- BBA Logistics Offered in Anchorage
- BS Technology - Combine with two year AAS degrees with options in advanced technology studies or business management and logistics. Offered in Anchorage and Valdez.
- B. Technology - Similar to the BS Technology program. Offered in Fairbanks.
- Business Management - All locations and distance
- BS Engineering - UAF & UAA
- BS Geology / Mining Engineering - UAF

# Career Lattice Jobs & Education



# Alaska's Future Jobs

## Year 2010 Projection



Source: Alaska Department of Labor and Workforce Development , Research and Analysis Section

# Training Examples for Alaskan Industry Jobs

	Time to Train	UA / X-state Campuses	State Voc-Tech Schools	Unions / Apprenticeships	Private Tech Schools	Secondary Schools
<b>CRAFTS</b>						
Helper / Apprentice	2-3 years	X	X	X	X	X
Journeyman	4-5 years	X	X	X	X	
<b>MATERIALS</b>						
Fork Lift Operators	<1 year		X		X	
Coord. / Expeditors	2-3 years	X				
<b>INSPECTORS</b>						
Civil	4 years	X			X	
Pipeline	2-4 years					
<b>SURVEYORS</b>	2-3 years	X		X		
<b>SAFETY</b>						
Consultants	2-4 years	X		X	X	
Flaggers	< 1 year			X	X	
<b>ENVIRONMENTAL</b>						
Technician	2-4 years	X	X			
Engr/Specialist	4-5 years	X				
<b>EQUIPMENT OPERATORS</b>						
Helper / Apprentice	2-3 years		X	X	X	
Journeyman	4 years		X	X	X	
<b>CAMPS / CATERING</b>						
Catering	1-2 years	X	X		X	X
Maintenance	2-4 years		X	X		
Medical	1-4 years	X	X		X	X
<b>ADMINISTRATIVE</b>						
Aides / Clerks	1-2 years	X	X		X	X
Management	3-4 years	X	X		X	
<b>LOGISTICS</b>						
Air Transport	2-4 years	X			X	
Coordinators	2-4 years	X			X	
Drivers	<1-2 years		X	X	X	
<b>OFFICE &amp; FIELD ENGINEERING</b>						
Technician	2 years	X			X	
B.S	4-5 years	X			X	
<b>SECURITY</b>	1-4 years		X			X

How to find information about jobs and job training on the internet:

1. Go to [www.jobs.state.ak.us](http://www.jobs.state.ak.us) (the Alaska Job Center Network)
2. Choose the "Job Bank" for current job listings (Quick-Links)
3. Choose "Job Training" from the main menu for various ways to get training
4. Choose "North Slope Gas Pipeline Workforce Development" (Hot Topics)



# Industry Jobs

- All jobs will require **safety orientation** and good “employability skills”
- All jobs will require **ongoing education** and training – start now...
- Some **post secondary education** is essential for jobs with \$20+ entry level wages and long term job outlooks.
- Experience can substitute – but less often than in the past.



## Mining Training Resources

Many skills are transferable.

Delta Mine Training Center

Bristol Bay Native Association Workforce Development Center

University of Alaska – Bristol Bay Campus

Southwest Alaska Vocational Technical Center

Alaska Department of Labor (On-the-job-training programs)

Bristol Bay Economic Development Corporation

Alaska Mineral and Energy Resource Education Foundation (AMEREF)

Mine Safety and Health Administration

Mining & Petroleum Training Service



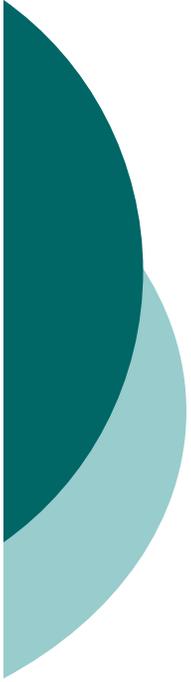
Careers Consortium



# Additional Resources



- APICCC Career Guide [[www.apiccc.org](http://www.apiccc.org)]
  - Videos, program links, workshops, YES, Career Path model...
- AVTEC [[www.avtec.alaska.edu](http://www.avtec.alaska.edu)]
- UA Campuses [[www.alaska.edu](http://www.alaska.edu)]
- Regional Learning Centers & colleges [[www.ilisagvik.cc](http://www.ilisagvik.cc)]
- AK Job Centers [[www.jobs.state.ak.us](http://www.jobs.state.ak.us)]



# QUESTIONS?