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## Career Paths and Apprenticeships at Alaska Ship & Drydock, Inc.

**Doug Ward**  
**Director of Shipyard Development**



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# Presentation Outline

- **Background leading to ASD career path & apprentice program development**
- **Methods and tools to design program**
- **Program implementation and management**
- **Research questions for ASD and NSRP**





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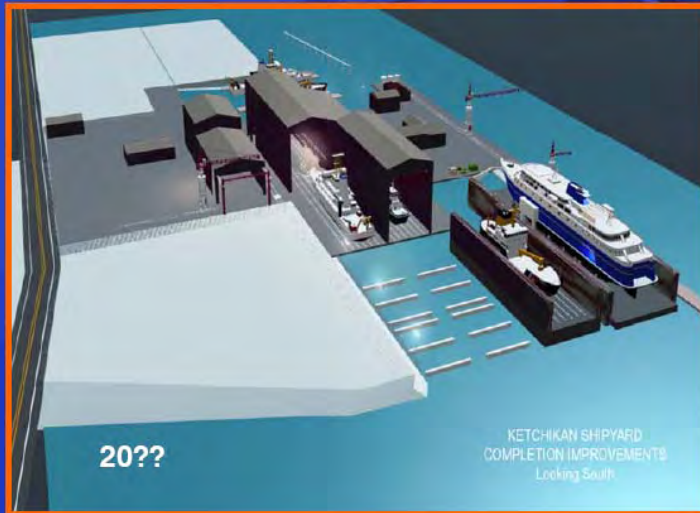
# Nearly a century of presence



1920's



2003



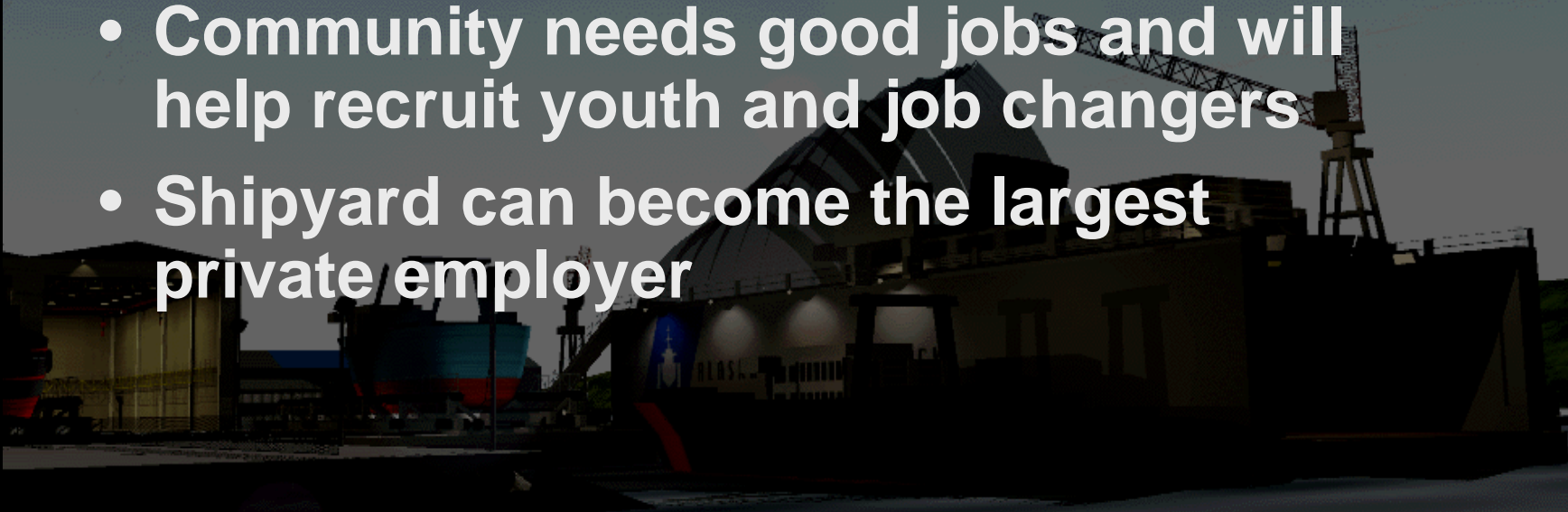
20??

KETCHIKAN SHIPYARD  
COMPLETION IMPROVEMENTS  
Looking South



# The setting

- Ketchikan – close to Nowhere, Alaska
- About 13,500 people
- Traditional economy – fishing, logging – declined in the 90s
- Community needs good jobs and will help recruit youth and job changers
- Shipyard can become the largest private employer





# Shipyard expansion & improvement

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**2<sup>nd</sup> dry-dock**  
**Production space**  
**Land-level berth**





# The Challenge

- **Public-Private Partnership**
  - State owns facilities; private company operator
- **Shipyard Improvement Plan**
  - About \$70 million in asset investment 2005-2011
  - Facilities and workforce blueprint
- **Key Objectives**
  - Market driven repair and new construction
  - Become shipyard of choice for stakeholders
  - Achieve 35% productivity improvement



# Workforce Development System

Image	News Coverage Manufacturing in the general economy	Popular Media TV shows, etc.	School Career Counselor Advice	Company Web Sites & Open House Tours	Career and Job Fairs	Company participation in education organizations	Family & Friend Referrals	Health, Safety & Environmental Reputations
Sources	K-12 School to Work	Technical - Vocational Education School to Work	Work to Work Job Changers & Dislocated Workers	Welfare to Work Persons Needing 2 <sup>nd</sup> or 3 <sup>rd</sup> Chance	Immigrants	Temporary & Contract Workers	Specialty Subcontractors & Teaming Partners	
Education	K-12 Curriculum	Technical - Professional Courses or Academies	Community or Junior Colleges	For-profit technical schools	Company-Education Partnership Models	Work-Study and Structured On-the-Job Training	Immigrant Programs ESL, etc.	
Support	School-to-Career Organizations	Job Service Recruitment & Referral	Labor Market Information and Statistics	Resource Center Interview Screening Testing	Education & Training Subsidies & Grants	State-Regional Special Programs	Skills Standards General Industry Specific	Welfare - To - Work Subsidies and Support
Shipyard	<div style="background-color: #e0ffff; padding: 10px; border: 1px solid black;"> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; text-align: center;">Recruitment and Hiring Process</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Orientation and Initial Training</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">On-The-Job Training and Mentoring</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">In-Company Apprentice Programs</div> <div style="border: 1px solid black; padding: 5px; text-align: center;">Perceptions of Professional Development &amp; Retention</div> </div> </div>							



# Workforce Development

- 2008 – 125 shipyard techs, average age about 50
- 2011 – 300 shipyard techs, average age much younger
- How to recruit, train, retain?

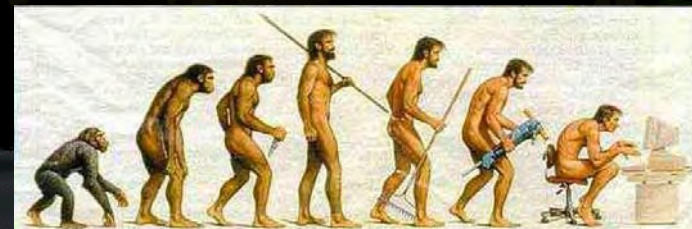




# Adaptive Change Strategy

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- Top down management to more participation
- From 'check your brain at the door and do what you're told' to a learning company
- From random assignment and promotion to a career path design
- From informal learning to planned and structured learning

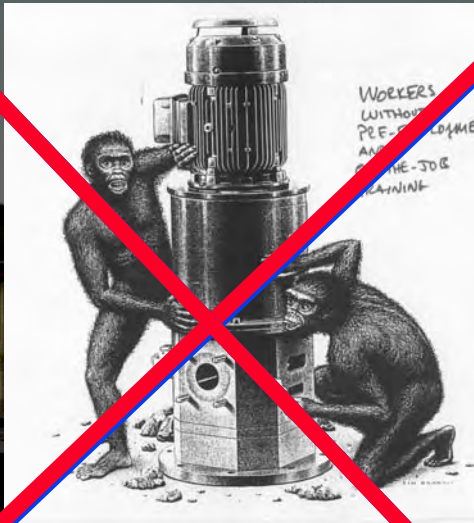




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# Key NSRP Training Concepts

- Determine what knowledge, skills, and abilities you need (skill standards)
- Determine what you have (audit system)
- Train the difference (new learning and upgrades)





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# Multi-skills needed 70% Repair and 30% Newbuild



Variable Draft



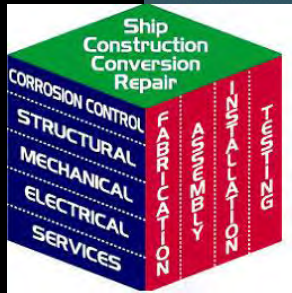
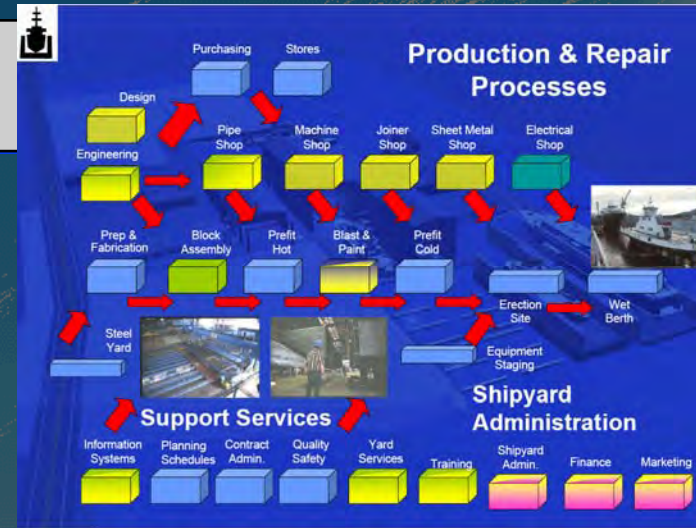


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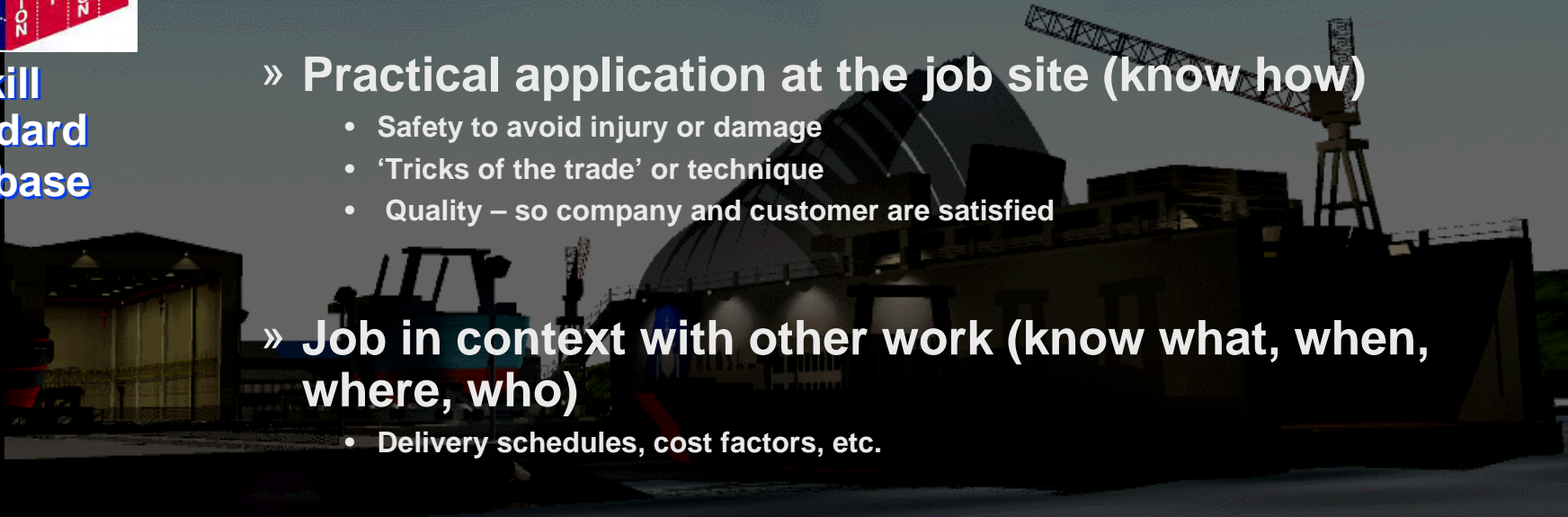
# What KSAs are needed?

- Logical work breakdown system

- Steps that advance each job
- Key points for each step
  - » Knowledge of theory and principles (know why)
  - » Practical application at the job site (know how)
    - Safety to avoid injury or damage
    - ‘Tricks of the trade’ or technique
    - Quality – so company and customer are satisfied
  - » Job in context with other work (know what, when, where, who)
    - Delivery schedules, cost factors, etc.



**Skill  
standard  
database**





# Analyze the KSAs fit to application in the shipyard

- Self-study – reading and web-based
- Classroom and group work
- Learning laboratories
- Structured on-the-job learning
- Learning support functions

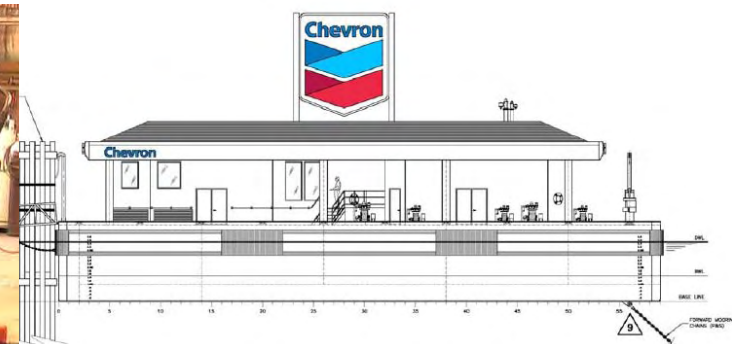


Elements of a  
specific skill  
standard



# Analyze the business to determine workforce mix

- Mix and volume of repair and new construction
- Shipyard workforce vs. subcontractors
- Trends toward technology/automation
- Result: career path mix and numbers of people needed



# Shipyard Career Paths & Major Processes



Shipyard 601  
Business-Master Craft

Master Crafts Track  
Management Track

≈ 4 Years

Newbuild  
Fabrication &  
Assembly  
Processes

Newbuild  
Blast & Paint  
Processes

Newbuild  
Installation  
Processes

Newbuild  
Systems  
Integration  
& Testing  
Processes

Shipyard 501  
Craft-Leadership

Leadman Track  
Supervisor Track

≈ 3 Years

Repair  
Ripout &  
Rebuild  
Processes

Repair  
Clean  
Blast  
Paint  
Processes

Repair  
Shop &  
On-board  
Processes

Repair  
Reinstall  
& Test  
Processes

Newbuild  
Repair  
Sea  
Trials  
Delivery

Shipyard 401  
Craft-Trade  
Team Lead

Journeyman

≈ 2 Years

**STRUCTURAL**  
Cutting  
Forming  
Welding  
Fitting  
Fabrication  
Assembly

**CORROSION  
CONTROL**  
Protection  
Blasting  
Painting  
Deck Covering

**SERVICES**  
Drydock  
Logistics  
Temporary  
Light, Vent  
Cleaning  
Hazmat

**ELECTRICAL**  
Cables  
Motors  
Switchgear  
Controls  
Electronics

**MECHANICAL**  
Outside  
Inside Shops  
Carpentry  
Pipes

**ADMINISTRATIVE**  
Estimating  
Planning  
Scheduling  
Contracts  
Accounting  
Quality  
Safety  
Environmental

Shipyard  
301 - multi-  
skill  
201 - craft

≈ 1 Year  
Shipyard  
101

*What employees need to know about their own career path to begin progress toward journeyman status. Classroom, self-study, learning lab courses. Structured On-the-Job learning mentored and coached by production workers and supervisors. SOJT certified by qualified Job Instructor. Includes appropriate cross-training: tack welding, fork-lift truck operation, etc.*

*Basic function of the shipyard; safety-health-environmental orientation; how the company makes money; basic customer orientation; Employee Handbook review; basic elements of quality; use of hand to ols. National Shipbuilding Research Program skill standards add shipyard-specific skill standards.*

Core  
Entry

*Work ethic - presenteeism; cooperation & respect; listening-reading-speaking-interacting communications; math; safety-health-environmental concepts. Manufacturing Skill Standards Council (MSSC) high-performance manufacturing curriculum and skill standards prepare workers.*



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# Alaska Apprentice Programs

- US DOL model adapted to the company



DEPARTMENT OF LABOR

29 CFR Part 29

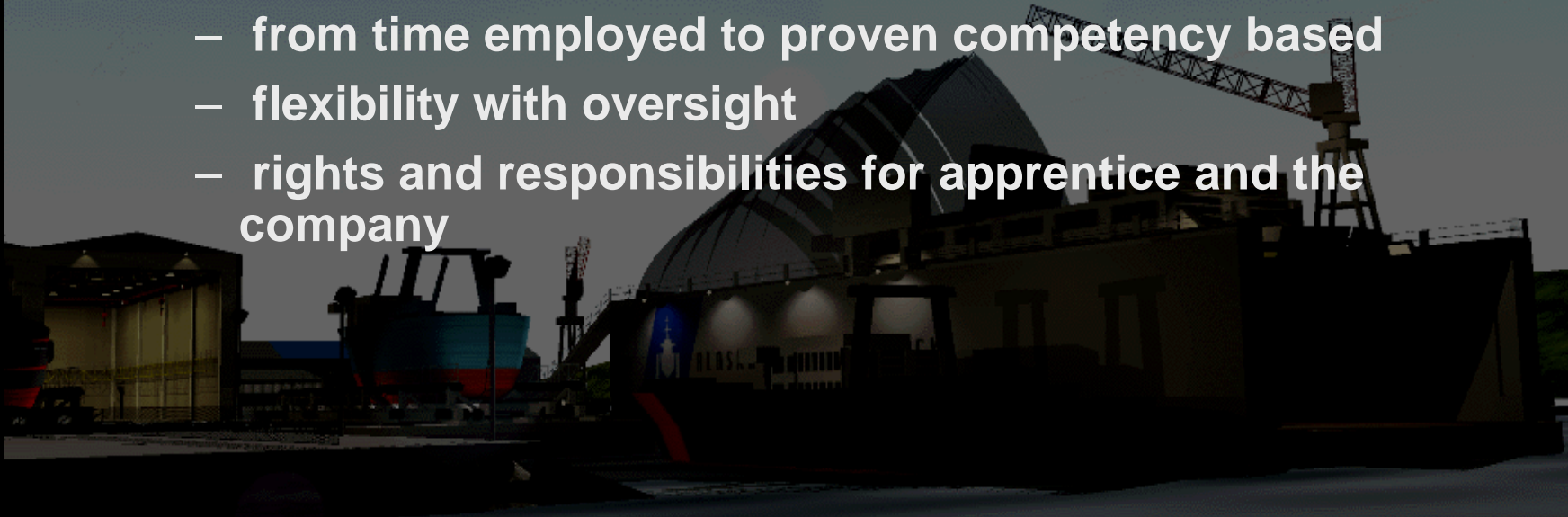
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Apprenticeship Programs, Labor  
Standards for Registration,  
Amendment of Regulations



- Implementing 'new' rules

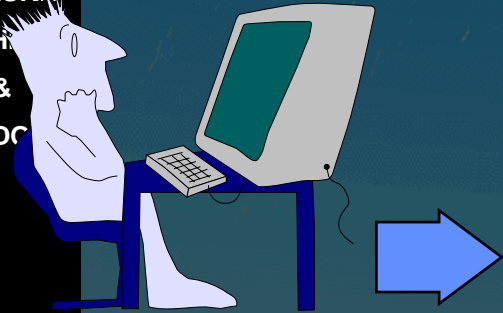
- from time employed to proven competency based
- flexibility with oversight
- rights and responsibilities for apprentice and the company





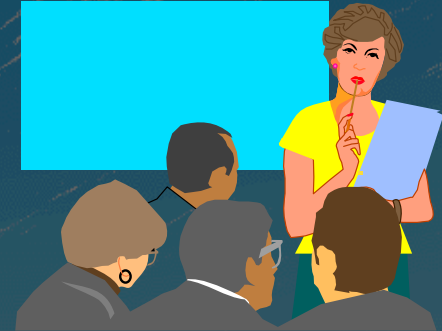
# Apprentice flowpath

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*assess experience & skills, physical & mental qualification, attitudes*

- **2-week process – one of three outcomes**
- no restrictions
- remediation (?)
- not suitable



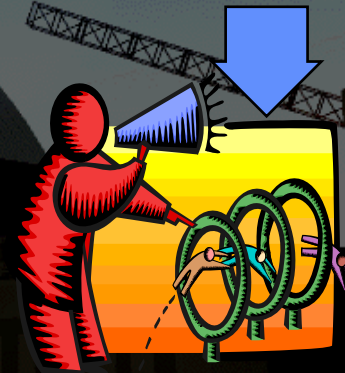
## Shipbuilding 101

*Orientation, expectations, basic welding-fitting  
5-week work/study/trial*

- **multi-trades skills**
- **mentoring to find career ladder**
- **pay goes up as added skills are certified**
- **skill upgrades**



*Apprentice for competent shipbuilding & repair, & flexible manufacturing, theory, principle & Prototype/hands-on & teams*



*On-the-job rotation  
5-weeks through the workstations*



# Shipyard Technician Apprentice Blocks of Multi-Skill

- Heavy Fabrication
- Shipfitting
- Welding
- Material handling & Rigging
- Temporary Services
- QA/NDT
- Machinery
- Pipefitting
- Sheet metal
- Outside machinery
- Paint-insulate
- Electrical
- Mech. Maintenance
- Elec. Maintenance
- Carpentry

**Foundation of safety & responsibility**



# Choosing apprentices & instructors

- Career path management
- Trained Instructor: volunteer or assigned as part of professional development
- Apprentice: new hire, job changer, or incumbent upgrade to multi-skill



## A Supervisor's Five Needs

Detailed learning Modules Available

1. Knowledge of the work
2. Knowledge of responsibilities
3. Skill in instructing
4. Skill in improving methods
5. Skill in leading





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# Theory & Principles

- **Toward a web-based system**
- **Learning modules with quiz 10-30 minutes**
  - Learning center, other shipyard or home access
  - Adapt commercial off-the-shelf where available
  - Customize or build for shipyard use
- **Moodle learning management system**





# Learning Labs

- Place to gain hands-on experience and practice
  - Prototypes and simulators: Polyspec, welding, confined spaces, etc.
- Train key shipyard people as instructors
- Checklist of KSA from NSRP skill standards adapted to ASD



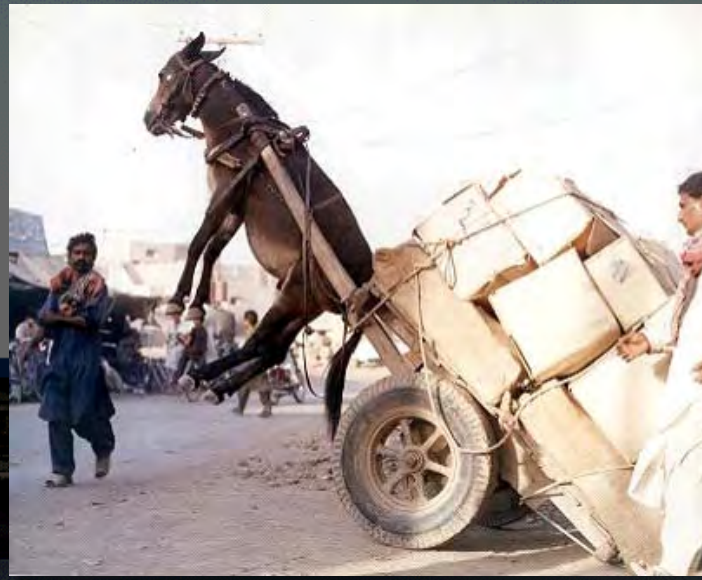




# Certification

- **Assessment**

- Knowledge – written quizzes
- Skills – practical exam – physical proof
- Abilities – oral discussion to verify learner understands contexts and related work and responsibilities



**If the worker  
hasn't  
learned, the  
instructor  
hasn't taught**



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# Research Questions

- Balance of self-group-lab-OJT to accelerate learning
- Integration of apprentice development into pay/benefits and responsibilities matrix
- Use of emerging technology: second life virtual learning
- Collaboration with skill-related businesses
- Role of high-school and college