



6. Date: **7-5-06** Reviewed by Trade Committee and agrees RSI Plan is reasonably consistent with other RSI Plans for the industry

**William Bowser**  
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**Signature of Trade Committee Chair**

**William Bowser**  
\_\_\_\_\_  
**Print Name**

7. Date: **7-5-06** RSI Plan reviewed by the State Board for Community and Technical Colleges

**Pat Ward**  
\_\_\_\_\_  
**Signature for SBCTC**

**Pat Ward**  
\_\_\_\_\_  
**Print Name**

8. Date: \_\_\_\_\_ Sent by SBCTC to WSATC with recommendation

## Apprenticeship RSI Plan

NOTE: The description of each element should be in sufficient detail to provide adequate information for review by the SBCTC.

Element: <b>Basic Welding</b>	Planned Hours	<b>30</b>
Description of Program: <b>Learn basic welding techniques. Designed for individuals who use welding occasionally in their trade. Training can be tailored to meet each person's interest. Must bring gloves, hood, goggles and safety glasses.</b>		

Element: <b>Basic MIG &amp; TIG Welding</b>	Planned Hours	<b>30</b>
Description of Program: <b>Learn basic MIG and TIG welding process. Training can be tailored to meet individual needs. Must bring gloves, hood, goggles, safety glasses and tungsten.</b>		

Element: <b>Stationary Engineer</b>	Planned Hours	<b>70</b>
Description of Program: <b>Instruction in the operation of heating systems with low- and high-pressure boilers.</b>		
HAC 210 Clover Park Technical College or equivalent course		

Element: <b>EPA Refrigerant Certification</b>	Planned Hours	<b>12</b>
Description of Program: <b>Mandatory course designed to provide EPA nationally recognized certification required for purchasing, removing and recycling of refrigerants. The class is a 12-hour training session with the certification test upon completion and is taught by a registered proctor.</b>		
HAC 230 Clover Park Technical College or equivalent course		

Element: <b>Basic Refrigeration I</b>	Planned Hours	<b>90</b>
Description of Program: <b>Introduction to controls, thermal physics, and equipment for air –conditioning system installation and servicing.</b>		
Prerequisites: IMT 135 & IMT 140		
HAC 235 Clover Park Technical College of equivalent course		

Element: <b>Math for Industrial Professions</b>	Planned Hours	<b>55</b>
Description of Program: <b>Develops elements of algebra, geometry, metric measure, and trigonometry to calculate areas, volumes, and angles for polygonal objects, objects with smooth curves, and composite objects; with applications to material strength, tapers, pulleys, gears, screw threads, and elementary engines.</b>		
Prerequisites: <u>MATH 091</u> and knowledge of basic trigonometry.		
MAT 105 Clover Park College or equivalent course		

Element: <b>Mechanical Drafting I</b>	Planned Hours	<b>50</b>
Description of Program: <b>Introductory level mechanical drafting. Includes traditional manual tool usage, level plane geometry, shape descriptions and projection theory.</b>		
CAD 101 South Puget Sound Community College or equivalent course		

Element: <b>General Physics I</b>	Planned Hours	<b>50</b>
Description of Program: <b>Fundamental principles and applications of physics: mechanics.</b>		
Prerequisite: <u>MATH 099</u> and knowledge of basic trigonometry.		
PHYS 114 South Puget Sound Community College or equivalent course		

Approved Training Seminars

Element: <b>Cross-connection/Backflow Prevention Certification</b>	Planned Hours	<b>40</b>
Description of Program: <b>Course offers essential knowledge and skills needed to meet minimum requirements for Backflow Assembly Tester Certification in Washington. Participants will learn how to identify different types of backflow presenters, their components, and how they function. They will also learn how to inspect backflow prevention assembly installations. They will practice state-approved procedures to test and diagnose simulated problems in all types of approved backflow prevention assemblies. The course includes practice in recording and reporting assembly testing results. The test includes 100 written questions and a practical exam.</b>		
WETRC or equivalent course		

The following courses are from the TPC Training Systems

Element: <b>101 Reading Blueprints</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers all types of blueprints used in industrial plants. Discusses machine parts and machine drawings. Features drawings of a compound rest and a clutch-brake control. Examines hydraulic, pneumatic, piping, plumbing, electrical, air-conditioning, and refrigeration drawings. Introduces sketching used in industrial plants.</b>	

Element: <b>102 Reading Schematics &amp; Symbols</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers all types of schematics and symbols used in commercial and industrial settings. Examines symbols on schematics, electrical symbols and diagrams, piping symbols and diagrams, hydraulic and pneumatic diagrams and symbols. Discusses air conditioning and refrigeration systems, including explanations of electrical/electronic control schematics. Covers welding and joining symbols.</b>	

Element: <b>103 Using Mathematics in the Plant</b>	Planned Hours <b>20</b>
Description of Program: <b>Begins by introducing mathematical basics—numbers and numerals, subtraction, addition, multiplication, and division. Examines common fractions and decimal fractions, ratios and proportions, powers and roots. Discusses the calculator: usage, basic and special functions, internal logic, and special purpose calculators. Moves on to cover geometry, algebra, and formulas for problem solving. Concludes by explaining properties of triangles and trig and inverse trig functions.</b>	

Element: <b>104 Making Measurements</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers units of measurement used in commercial and industrial applications. Examines all aspects of basic measurement concepts and procedures, including accuracy and tolerance. Discusses techniques and devices for comparison measurements (dial indicators and gauge blocks). Shows common methods for measuring volume, motion, force, temperature, fluid flow, and electricity. Explains how to use scales and rules, combination calipers, and micrometers.</b>	

Element: <b>105 Working with Metals in the Plant</b>	Planned Hours <b>20</b>
Description of Program: <b>Introduces metals, metallurgy, and metalworking. Discusses the properties of metals, including their mechanical properties. Examines several industrial manufacturing processes. Covers iron and standard steels. Explains the different kinds of heat treatment and their usage. Discusses some techniques of working with copper, aluminum, magnesium, titanium, lead, nickel, tin, and zinc.</b>	

Element: <b>106 Working with Nonmetals in the Plant</b>	Planned Hours <b>20</b>
Description of Program: <b>Introduces major nonmetal materials and how they are most frequently used. Describes properties, characteristics, and classifications of each material. Covers synthetic and natural materials. Examines various paints and coatings, their proper use, preparation, and application. Surveys industrial chemicals. Chemical safety precautions are covered, along with the proper use of protective equipment.</b>	

Element: <b>107 Using Hand Tools</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers the most important hand tools used on the job. Begins with measuring tools, including a discussion of units of measurement. Examines the various kinds of wrenches and screwdrivers, their uses and handling techniques. Explains other hand tools by specialty: pipefitting tools, plumbing tools, electrician's tools, sheet metalworking tools, machinists' metal-working tools. Ends with hoisting and pulling tools.</b>	

Element: <b>108 Using Portable Power Tools</b>	Planned Hours <b>20</b>
Description of Program: <b>Explains the uses, selection, safety, and care of industrial power tools: electric drills, electric hammers, pneumatic drills and hammers, screwdrivers, nutrunners, wrenches, linear-motion and circular saws, routers and planes, electric sanders, grinders, and shears. Covers tool sharpening techniques for selected tools.</b>	

Element: <b>110 Developing Troubleshooting Skills</b>	Planned Hours <b>20</b>
Description of Program: <b>Explores the subject of troubleshooting and the importance of proper maintenance procedures. Covers working with others, aids in communication, and trade responsibilities. Outlines troubleshooting techniques and aids, using schematics and symbols. Focuses on specific maintenance tasks, breakdown maintenance, and planned maintenance.</b>	

Element: <b>301 Basic Mechanic</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers force and motion, work and energy, and fluid mechanics as applied in industrial maintenance. Explains principles of operation for simple machines, such as the lever, inclined plane, wheel and axle, pulley, and screw. Explains the basic elements of industrial machines, as well as common measurement tools used to monitor and adjust equipment. Covers hand tools, power tools and fasteners, ending with a discussion of ways to reduce friction and wear.</b>	

Element: <b>302 Lubricants and Lubrications</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers a complete lubrication training program, including functions and characteristics of lubricants, factors in selection of lubricants, and effects of additives. Oils, greases, and other compounds used for lubrication are described, as well as their applications. Lubrication methods and recommended storage and handling procedures are included.</b>	

Element: <b>303.1 Power Transmission Equipment</b>	Planned Hours <b>16</b>
Description of Program: <b>Covers belt drives, chain drives, gears and gear drives, adjustable-speed drives, shaft alignment, shaft coupling devices, and clutches and brakes.</b>	

Element: <b>304 Bearings</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers principles and applications of various types of bearings, including plain journal, ball, and roller bearings. Explains installation, inspection and repair of bearings. Deals with specialized bearings, including powdered-metal, nonmetallic, and hydrostatic bearings. Covers bearing seals, lubrication, and maintenance practices.</b>	

Element: <b>305 Pumps</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers typical applications of various types of pumps. Describes factors affecting pump selection. Explains operating principles of centrifugal, propeller, and turbine, rotary, reciprocating, and metering pumps. Includes special-purpose pumps, diaphragm pumps, and others designed to handle corrosive and abrasive substances. Covers pump maintenance, packing gland, seal, and bearing replacement.</b>	

Element: <b>306 Piping Systems</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers piping and tubing systems used for fluid transport in the plant: hydraulic fluids, steam, liquefied product, refrigerant, and water. Shows typical metallic and nonmetallic piping systems, pipe-joining methods, and how tubing and hoses differ from piping. Covers valves, pipe fittings, hangers, supports, and insulation, and shows how tubing is sized, fitted, bent, and joined. Explains uses of traps, filters, and strainers.</b>	

Element: <b>307 Basic Hydraulics</b>	Planned Hours <b>20</b>
Description of Program: <b>Covers hydraulic principles, types of hydraulic fluids and their characteristics. Describes components of the hydraulic system and their functions, including filters and strainers, reservoirs and accumulators, pumps, piping, tubing and hoses, control valves, relief valves, and actuating devices. Covers a variety of cylinders and hydraulic motors.</b>	

Element: <b>308 Hydraulic Troubleshooting</b>	Planned Hours <b>20</b>
Description of Program:	

**Covers understanding the systems, using schematic diagrams, installation procedures, cleanliness and safety. Includes tubing cutting, bending, and flaring, identification and selection of proper fluid, and charging the system. Discusses planned maintenance, specific repair/replacement recommendations, system diagnosis, and troubleshooting.**

Element: **309 Basic Pneumatics** Planned Hours **20**

Description of Program:

**Covers how work, force, and energy are applied to principles of pneumatics. Shows operating principles of reciprocating, positive displacement, rotary, and dynamic air compressors. Covers primary and secondary air treatment. Includes valves, logic devices, cylinders, and air motors.**

Element: **310 Pneumatic Troubleshooting** Planned Hours **20**

Description of Program:

**Covers pneumatic systems, schematic symbols and diagrams, installing system components, planned maintenance, system diagnosis, and troubleshooting. Includes maintenance of air compressors, control valves, air motors, electrical components, and hybrid systems.**

**Optional Coursework;**

Element: <b>Business and Professional Speaking</b>	Planned Hours <b>50</b>
Description of Program: <b>Assists students in developing real world oral communication skills. Capture the dynamics of today's business realities and see the benefits of effective communication. Selection of topics, library research, analysis, oral style, use of visual aids, and preparation and delivery of various types of speeches and oral presentations are included. The Internet, email, community interaction, and other practical tools support students' learning and increase their public speaking skills.</b>	
ENG 103 Clover Park Technical College or equivalent course	

Element: <b>Keyboarding Operations</b>	Planned Hours <b>30</b>
Description of Program: <b>Students will use computers to develop touch control and proper keyboarding techniques and will be introduced to the implementation of basic functions.</b>	
OFCT 105 Clover Park Technical College or equivalent course	