50-620-1 MECHATRONICS TECHNICIAN
50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE
50-464-1 MAINTENANCE TECHNICIAN
50-414-2 ELECTRICAL & INSTRUMENTATION APPRENTICE

Related Instruction Review

Date: November 4th, 2021

Project Review Team

College	App Coord/Dean	Instructor
BTC	Greg Phillips	Ryan Hartter
CVTC	Julie Sherman,	Darrin Falk. Jeff Johnson,
GTC	Steve McNaughton, Jennifer Pagan	Matthew Adams, Tony Lestan
LTC	Jeff Grunewald	David Schwobe
MATC-Madison	Randall Way	Tom Helbig
MPTC	Stephen Horvath	Josh Cohn,
MSTC	Ryan Kawski	Matt McCall, Jim Koskey
NTC	Katie Metko	Marc Martindale
SWTC	Derek Dachelet,	Stephen Goss, Bart Wood Jobert Bermudo
WCTC	Tim Alft	Wayne Buroker
WTC	Josh Gamer	Phillip Reed
WTCS	Nancy Nakkoul, Education Director – Apprenticeship, Construction, and Architecture	
WIDS	Melinda Schroepfer - WIDS Annette Czarnecki - WIDS	

Summary and Recommendations

Review	Summary and Recommendations
Curriculum Review Overview	The group recommended no changes to the 50-620-1 MECHATRONICS TECHNICIAN program or courses. The group recommended changes to seven courses that are shared in various configurations across the three programs: 50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE 50-464-1 MAINTENANCE TECHNICIAN 50-414-2 ELECTRICAL & INSTRUMENTATION APPRENTICE The group also recommended related instruction hour changes to: 50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE 50-464-1 MAINTENANCE TECHNICIAN

Suggested Alignments Courses in a Full-Time Program	There was not overwhelming support for alignment to full-time programs for any of the four programs.

Specific Recommendations

Course Change:

50-413-762 Industrial Electrician Motor Controls 1 Recommendations:	**Recommended Change Results:**
Instructional Level - Technical Diploma Total Credits 1 = 36 hours **Course Competencies:** 1. Apply safety procedures, tools, and instrument to specific situations 2. Draw a computer-generated ladder diagram 3. Complete the decision/action portion of a line drawing 4. Draw a circuit that incorporates control devices and timers 5. Draw a reversing control circuit for a three-phase DC motor **Remove:** • Draw a circuit that incorporates control devices and timers – moved to MC 2 • Draw a reversing control circuit for a three-phase AC motor – moved to MC 2 **Add:** • Demonstrate the ability to select test equipment – moved from MC3 (added to MC 1 and 2) • Demonstrate the ability to implement the proper techniques in troubleshooting an electrical motor control circuit– moved from MC3 (added to MC 1 and 2) • Demonstrate the ability to gather information – moved from MC3 (added to MC 1 and 2)	Instructional Level - Technical Diploma Total Credits 1 = 36 hours **Course Competencies:** 1. Apply safety procedures, tools, and instrument to specific situations 2. Complete the decision/action portion of a line drawing 3. Select test equipment 5. Implement the proper techniques in troubleshooting an electrical motor control circuit 6. Gather information

Course Change:

50-413-763 Industrial Electrician Motor Controls 2	**Recommended Change Results:**
Instructional Level - Technical Diploma Total Credits 1 = 36 Hours **Course Competencies:** 1. Apply electromechanical and solid-state devices to a specific situation 2. Draw a speed control and a reduced voltage control circuit **Add**: • ~~Demonstrate the ability to~~ select test equipment – moved from MC3 (added to MC 1 and 2) • ~~Demonstrate the ability to~~ implement the proper techniques in troubleshooting an electrical 2. motor control circuit– moved from MC3 (added to MC 1 and 2) • ~~Demonstrate the ability to~~ gather information – moved from MC3 (added to MC 1 and 2) • Draw a circuit that incorporates control devices and timers – moved from MC 1 • Draw a reversing control circuit for a three-phase ~~DC~~ AC motor – moved from MC 1	Instructional Level - Technical Diploma Total Credits 1 = 36 hours **Course Competencies:** 1. Apply electromechanical and solid-state devices to a specific situation 2. Select test equipment 3. Implement the proper techniques in troubleshooting an electrical motor control circuit 4. Gather information 5. Draw a circuit that incorporates control devices and timers 6. Draw a reversing control circuit for a three-phase AC motor

Course Change:

50-413-764 Industrial Electrician Motor Controls 3	**Final Recommended Changes**
Instructional Level Technical Diploma Total Credits 1 36 hours **Course Competencies:** 1. Demonstrate the ability to gather information 2. Demonstrate the ability to select test equipment 3. Demonstrate the ability to implement the proper techniques in troubleshooting an electrical motor control circuit 4. Formulate a preventative maintenance program **Add**:	50-413-764 Industrial Electrician Motor Controls 3 Instructional Level Technical Diploma Total Credits 1 36 hours **Course Competencies:** 1. ~~G~~ather information 2. Select test equipment 3. ~~I~~mplement the proper techniques in troubleshooting an electrical motor control circuit

• Draw a speed control and a reduced voltage control circuit – moved from MC 2 • Detail the various mechanical and electronic methods used in accelerating and decelerating AC and DC motors – moved from MC 2	4. Formulate a preventative maintenance program 5. Draw a speed control and a reduced voltage control circuit 6. Detail the various mechanical and electronic methods used in accelerating and decelerating AC and DC motors

Resulting recommended configuration of the three EMC courses in a series:

50-413-762 Industrial Electrician Motor Controls 1	**50-413-763 Industrial Electrician Motor Controls 2**	**50-413-764 Industrial Electrician Motor Controls 3**
Course Competencies: 1. Apply safety procedures, tools, and instrument to specific situations 2. Complete the decision/action portion of a line drawing 3. Select test equipment 4. Implement the proper techniques in troubleshooting an electrical motor control circuit 5. Gather information	**Course Competencies:** 1. Apply electromechanical and solid-state devices to a specific situation 2. Select test equipment 3. Implement the proper techniques in troubleshooting an electrical motor control circuit 4. Gather information 5. Draw a circuit that incorporates control devices and timers 6. Draw a reversing control circuit for a three-phase AC motor	**Course Competencies:** 1. Gather information 2. Select test equipment 3. Implement the proper techniques in troubleshooting an electrical motor control circuit 4. Formulate a preventative maintenance program 5. Draw a speed control and a reduced voltage control circuit 6. Detail the various mechanical and electronic methods used in accelerating and decelerating AC and DC motors

Course Change:

50-464-718 Fluid Power Systems for Maintenance Tech Apprentices	**Result of Recommended Changes:**
Instructional Level - Technical Diploma Total Credits .75 = 24 Hours **Course Competencies**	Instructional Level - Technical Diploma Total Credits 2 (72 hours)

1. Define the principles of fluid power systems for hydraulics and pneumatics 2. Interpret fluid power system schematic diagrams 3. Analyze the roles and functions of fluid power system components 4. Explain the functions of valves used in fluid power systems 5. Apply troubleshooting principles to both pneumatic and hydraulic systems ADD Competency: Control pneumatics and hydraulics electrically Recommend bumping this up to 72 hour minimum to allow for more hydraulics content.	**Course Competencies:** 1. Define the principles of fluid power systems for hydraulics and pneumatics 2. Interpret fluid power system schematic diagrams 3. Analyze the roles and functions of fluid power system components 4. Explain the functions of valves used in fluid power systems 5. Apply troubleshooting principles to both pneumatic and hydraulic systems 6. Control pneumatics and hydraulics electrically

Course Change:

50-464-712 Bearings, Measurement & Printreading for Maintenance Tech Apprentices	**Recommended Changes Results:**
Instructional Level - Technical Diploma Total Credits 2 = (72 hours) **Course Competencies** 1. Examine different types of precision measurement instruments and their uses 2. Take measurements with tape measures and steel rules 3. Take measurements with micrometers 4. Take measurements with calipers 5. Take measurements with indicators 6. Take height measurements with various types of gauges 7. Examine different types of prints 8. Interpret parts prints and drawings 9. Interpret mechanical prints 10. Interpret structural drawings/prints 11. Demonstrate awareness of CAD generated drawings and prints 12. Examine different bearing types and their applications 13. Handle equipment bearings 14. Inspect a bearing 15. Analyze bearing failures 16. Remove a bearing 17. Select a bearing 18. Mount a bearing 19. Lubricate a bearing Recommend consolidating/reducing the number of competencies. Recommend reducing hours to 36 (1 Credit).	Instructional Level - Technical Diploma Total Credits 1 = (36 hours) **Course Competencies** 1. Take measurements with appropriate measuring device(s) **Criteria:** • Take measurements with tape measures and steel rules • Take measurements with micrometers • Take measurements with calipers • Take measurements with indicators • Take height measurements with various types of gauges 2. Interpret prints **Criteria:** • Examine different types of prints • Interpret parts prints and drawings • Interpret mechanical prints • Interpret structural drawings/prints • Interpret CAD generated drawings and prints 3. Identify bearing types and their applications **Criteria:** • Handle equipment bearings • Examine bearing types • Inspect a bearing • Analyze bearing type applications 4. Install and replace bearings **Criteria:** • Remove a bearing • Analyze bearing failures • Select a bearing • Mount a bearing • Lubricate a bearing

Course Change:

50-464-718 Fluid Power Systems for Maintenance Tech Apprentices	**Results of Recommended Changes:**
Instructional Level - Technical Diploma Total Credits .75 = 24 Hours **Course Competencies** 1. Define the principles of fluid power systems for hydraulics and pneumatics 2. Interpret fluid power system schematic diagrams 3. Analyze the roles and functions of fluid power system components 4. Explain the functions of valves used in fluid power systems 5. Apply troubleshooting principles to both pneumatic and hydraulic systems ADD Competency: Control pneumatics and hydraulics electrically Recommend bumping this up to 72 hour minimum to allow for more hydraulics content.	Instructional Level - Technical Diploma Total Credits 2 = (72 hours) **Course Competencies** 1. Define the principles of fluid power systems for hydraulics and pneumatics 2. Interpret fluid power system schematic diagrams 3. Analyze the roles and functions of fluid power system components 4. Explain the functions of valves used in fluid power systems 5. Apply troubleshooting principles to both pneumatic and hydraulic systems 6. Control pneumatics and hydraulics electrically

RECOMMENDED PROGRAM CHANGE: Industrial Electrician

50-413-769 Industrial Electrician Programmable Logic Controllers 1	**Results of Recommendations:**
Instructional Level Technical Diploma Total Credits 1 36 hours **Course Competencies** 1. Perform basic computer operations 2. Illustrate the function of each major component of a Programmable Logic Controller 3. Differentiate numbering systems used with Programmable Logic Controllers 4. Define the fundamental logic gates used with Programmable Logic Controllers No Change to course. Recommend adding the PLC 2 and 3 courses to the program – 1 credit (36 hours) each	**Recommend adding the PLC 2 and 3 courses to the program:** **50-413-770 Industrial Electrician Programmable Logic Controllers 2: This would Add 1 Credit (36 hours) to the program** **50-413-771 Industrial Electrician Programmable Logic Controllers 3: This would Add 1 Credit (36 ours) to the program.**

WTCS Related Instruction Review

50-620-1 MECHATRONICS TECHNICIAN APPRENTICE
50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE
50-464-1 MAINTENANCE TECHNICIAN APPRENTICE
50-414-2 ELECTRICAL & INSTRUMENTATION APPRENTICE

1

Systematic Planned Reviews

- All apprenticeships
- Over 5 years
- Flexible to meet employer and WTCS needs

2

Goals

- Update course documentation to ensure curriculum is accurate
  - Course Competencies
  - Performance Standards
  - Credits/Hours
- Examine potential alignments with other credentials
  - WTCS fulltime programs
- Discuss the Delivery Options for Courses

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FY21-22 Projects

- 50-401-9 HVAC APPRENTICE
- 50-420-9 INDUSTRIAL MANUFACTURING TECHNICIAN
- 50-413-6 ELECTRIC LINE APPRENTICE
- 50-413-7 METERING TECHNICIAN APPRENTICE
- 50-468-1 SUBSTATION ELECTRICIAN APPRENTICE
- 50-502-1 COSMETOLOGIST APPRENTICE
- 50-502-5 BARBER APPRENTICE
- 50-001-1 ARBORIST APPRENTICE
- 50-620-1 MECHATRONICS TECHNICIAN APPRENTICE
- 50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE
- 50-464-1 MAINTENANCE TECHNICIAN APPRENTICE
- 50-414-2 ELECTRICAL & INSTRUMENTATION APPRENTICE

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Review process

Share plan with BAS and Trade Committees initially and at spring meetings

- Survey employers to determine new needs and revisions

Create instructor team

- All colleges approved (with active enrollments past three years?) to offer the apprenticeship are invited to identify 1-2 instructors to participate.

Share course review packet

- WIDS will share the program configuration and COS packets for review

Conduct 1-4 web meeting reviews

- Faculty determine if changes are needed (1 web meeting)
- Faculty revise course outcome summaries (2-3 web meetings. Changes may include updates to course credits, competencies or performance standards and or new courses.
- Discuss potential for RA to TD alignment

Obtain approval

- Determine approvals needed
- WIDS provides a revision summary including major changes and justification for changes for discussion

Publish revisions

- Publish revisions from the Repository for college use

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50-620-1 MECHATRONICS TECHNICIAN
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WISCONSIN TECHNICAL COLLEGE SYSTEM

- BTC
- CVTC
- GTC
- LTC
- MATC-MDSN
- MPTC
- MSTC
- NTC
- SWTC
- WCTC
- WTC

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Curriculum Review Participants

College	App Coord/Dean	Instructor
BTC	Greg Phillips	Ryan Hartter
CVTC	Julie Sherman,	Darrin Falk, Jeff Johnson,
GTC	Steve McNaughton Jennifer Pagan	Matthew Adams Tony Lestan
LTC	Jeff Grunewald	David Schwobe
MATC-Madison	Randall Way	Tom Helbig,
MPTC	Stephen Horvath	Josh Cohn,
MSTC	Ryan Kawski	Matt McCall Jim Koskey
NTC	Katie Metko	Marc Martindale
SWTC	Derek Dachelet,	Stephen Goss Bart Wood Jobert Bermudo
WCTC	Tim Alft	Wayne Buroker
WTC	Josh Gamer	Phillip Reed
WTCS	Nancy Nakkoul, Education Director – Apprenticeship, Construction, and Architecture	
WIDS	Melinda Schroepfer - WIDS Annette Czarnecki - WIDS	

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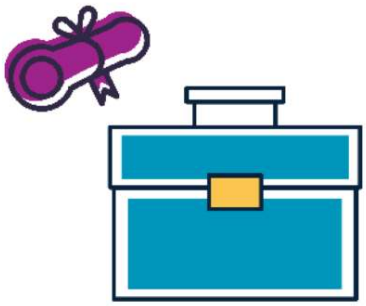
College Degree Alignments:

Reponses were consistent across all four programs' surveys

- Some interest - No strong recommendations
- Some colleges already providing crosswalks to interested apprentices



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Delivery

- Online during COVID
- Some interest in hybrid delivery
- Faculty Recommendation: Students prefer face-to-face

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Curriculum Review

Outcomes

Credits

1 - Occupation Specific	28.5
2 - Occupation Supportive	
Total Credits	28.5

Term 1

Course #	Course Title	Credits	Function
50-413-750	DC Electricity for Industrial Electricians	.2	1 - Occupation Specific
50-413-751	AC Electricity for Industrial Electricians	.2	1 - Occupation Specific

Term 2

Course #	Course Title	Credits	Function
50-413-773	Safety & Print Reading for Industrial Electricians	.5	1 - Occupation Specific
50-413-760	Industrial Electrician Transformers	.1	1 - Occupation Specific
50-413-761	Industrial Electrician Motors & Generators	.1	1 - Occupation Specific
50-413-752	Codes for Industrial Electricians 1: Introduction to the NEC	.5	1 - Occupation Specific
50-413-753	Codes for Industrial Electricians 2: OCPD and Electrical Device Installations	.5	1 - Occupation Specific
50-413-756	Codes for Industrial Electricians 5: Article 300, Cords/Cables, and Hazardous Installations	.5	1 - Occupation Specific

Term 3

Course #	Course Title	Credits	Function
50-413-762	Industrial Electrician Motor Controls 1	.1	1 - Occupation Specific
50-413-763	Industrial Electrician Motor Controls 2	.1	1 - Occupation Specific

Term 4

Course #	Course Title	Credits	Function
50-413-764	Industrial Electrician Motor Controls 3	.1	1 - Occupation Specific
50-413-754	Codes for Industrial Electricians 3: Article 250 Part A	.5	1 - Occupation Specific
50-413-755	Codes for Industrial Electricians 4: Article 250 Part B	.5	1 - Occupation Specific

Term 5

Course #	Course Title	Credits	Function
50-413-765	Power Systems & Variable Speed Drives for Industrial Electricians	.2	1 - Occupation Specific

Term 6

Course #	Course Title	Credits	Function
50-413-766	Fluid Power Systems for Industrial Electricians - Pneumatics	.5	1 - Occupation Specific
50-413-767	Fluid Power Systems for Industrial Electricians- Hydraulics	.5	1 - Occupation Specific
50-413-772	Green Awareness for the E&I Trades	.1	1 - Occupation Specific
50-413-757	Codes for Industrial Electricians 6: Conductors, Raceways and Data/Communication Cables	.5	1 - Occupation Specific

Term 7

Course #	Course Title	Credits	Function
50-414-722	Troubleshooting Electronic Systems & Devices for E&I Apprentices	.1	1 - Occupation Specific
50-414-725	Introduction to Industrial Automated Systems for E&I Apprentices	.1	1 - Occupation Specific

Term 8

Course #	Course Title	Credits	Function
50-413-769	Industrial Electrician Programmable Logic Controllers 1	.1	1 - Occupation Specific
50-413-770	Industrial Electrician Programmable Logic Controllers 2	.1	1 - Occupation Specific

Term 9

Course #	Course Title	Credits	Function
50-413-771	Industrial Electrician Programmable Logic Controllers 3	.1	1 - Occupation Specific
50-413-758	Codes for Industrial Electricians 7: Motors and Generators	.5	1 - Occupation Specific
50-413-759	Codes for Industrial Electricians 8: Transformers	.5	1 - Occupation Specific

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Mechatronics – No shared courses with the other three programs. No recommended changes.

Eight courses shared among:
50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE
50-464-1 MAINTENANCE TECHNICIAN
50-414-2 ELECTRICAL & INSTRUMENTATION APPRENTICE

Seven courses shared between:
50-413-1 INDUSTRIAL ELECTRICIAN APPRENTICE
50-464-1 MAINTENANCE TECHNICIAN

Faculty Provided Recommendations for Seven Courses (4 Shared)

Course Number, Name and Hours	Course Title	Shared?
50-413-773 18 hours	Safety & Print Reading for Industrial Electricians	• Electrical and Instrumentation Technician • Maintenance Technician • Industrial Electrician
50-413-762 36 hours	Industrial Electrician Motor Controls 1	• Maintenance Technician • Industrial Electrician
50-413-763 36 hours	Industrial Electrician Motor Controls 2	• Maintenance Technician • Industrial Electrician
50-413-764 36 hours	Industrial Electrician Motor Controls 3	• Maintenance Technician • Industrial Electrician
50-413-769 36 hours	Industrial Electrician Programmable Logic Controllers 1	• Industrial Electrician Only – Not Shared
50-464-718 24 hours	Fluid Power Systems for Maintenance Tech Apprentices	• Maintenance Technician Only – Not shared
50-464-712 72 hours	Bearings, Measurement & Print Reading for Maintenance Tech Apprentices	• Maintenance Technician Only – Not shared

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Curriculum Review	Summary and Recommendations
50-413-762 Industrial Electrician Motor Controls 1 • Maintenance Technician • Industrial Electrician	**Remove:** • Draw a circuit that incorporates control devices and timers – move to MC 2 • Draw a reversing control circuit for a three-phase AC motor – move to MC 2 **Add:** • Select test equipment – move from MC3 (add to MC 1 and 2) • Implement the proper techniques in troubleshooting an electrical motor control circuit– move from MC3 (add to MC 1 and 2) • Gather information – move from MC3 (add to MC 1 and 2)
50-413-763 Industrial Electrician Motor Controls 2 • Maintenance Technician • Industrial Electrician	**Add:** • Select test equipment – moved from MC3 (added to MC 1 and 2) • Implement the proper techniques in troubleshooting an electrical motor control circuit– move from MC3 (added to MC 1 and 2) • Gather information – move from MC3 (add to MC 1 and 2) • Draw a circuit that incorporates control devices and timers – move from MC 1 • Draw a reversing control circuit for a three-phase AC motor – move from MC 1
50-413-764 Industrial Electrician Motor Controls 3 • Maintenance Technician • Industrial Electrician	**Add:** • Draw a speed control and a reduced voltage control circuit – move from MC 2 • Detail the various mechanical and electronic methods used in accelerating and decelerating AC and DC motors – move from MC 2

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50-413-762 Industrial Electrician Motor Controls 1	50-413-763 Industrial Electrician Motor Controls 2	50-413-764 Industrial Electrician Motor Controls 3
Course Competencies: 1. Apply safety procedures, tools, and instrument to specific situations 2. Complete the decision/action portion of a line drawing 3. Select test equipment 4. Implement the proper techniques in troubleshooting an electrical motor control circuit 5. Gather information	**Course Competencies:** 1. Apply electromechanical and solid-state devices to a specific situation 2. Select test equipment 3. Implement the proper techniques in troubleshooting an electrical motor control circuit 4. Gather information 5. Draw a circuit that incorporates control devices and timers 6. Draw a reversing control circuit for a three-phase AC motor	**Course Competencies:** 1. Gather information 2. Select test equipment 3. Implement the proper techniques in troubleshooting an electrical motor control circuit 4. Formulate a preventative maintenance program 5. Draw a speed control and a reduced voltage control circuit 6. Detail the various mechanical and electronic methods used in accelerating and decelerating AC and DC motors

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Curriculum Review	Summary and Recommendations
50-413-769 Industrial Electrician Programmable Logic Controllers 1 • **Industrial Electrician**	**No changes to the individual course:** **Recommend adding the PLC 2 and 3 courses to the program:** • **50-413-770 Industrial Electrician Programmable Logic Controllers 2 -adds 36 hours to the program** • **50-413-771 Industrial Electrician Programmable Logic Controllers 3 -adds 36 hours to the program** **Total potential hours: 72**

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Curriculum Review	Summary and Recommendations
50-464-718 - Fluid Power Systems for Maintenance Tech Apprentices • **Maintenance Technician**	• Recommend adding 1 competency: - Control pneumatics and hydraulics electrically • Recommend bumping this up from 36 to 72 hour minimum to allow for more hydraulics content. **Adds 36 hours to program.**
50-464-712 Bearings, Measurement & Print Reading for Maintenance Tech Apprentices • **Maintenance Technician**	• Recommend consolidating/reducing the number of competencies. • Current competencies are redundant. • Recommend reducing hours from 72 to 36 because current content can be addressed in 36 hours. **Removes 36 hours from program.**

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Your Turn

- Questions?
- Concerns?

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