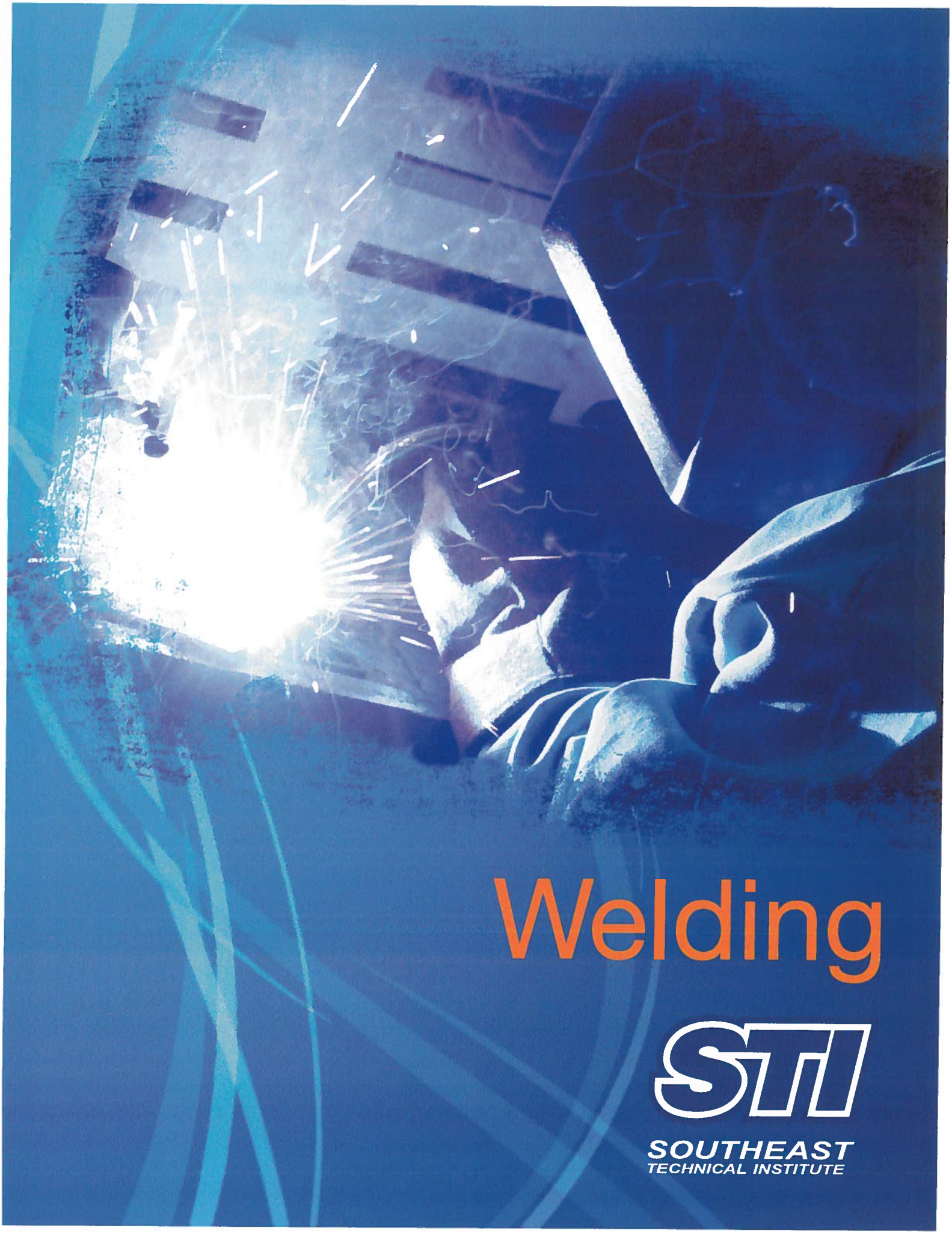

Welding

STI

SOUTHEAST
TECHNICAL INSTITUTE

Southeast Technical Institute

New Program Application

Welding

Diploma

Fall 2012

Welding – Diploma

Executive Summary

STI is responding to the need for welders in South Dakota by re-instating a welding diploma program. The Manufacturing summit held in Mitchell highlighted the shortage as well as the increased demand for welders not only in the James River Valley, but also in southeastern South Dakota. Working in conjunction with the Governor's Office and the Governor's Office of Economic Development, STI hopes to address the shortage and meet demands for the future.

STI stopped taking Welding Students into the Welding Diploma Program in 2002 and developed a certificate program through the Business and Industry Training division, now known as Training Solutions Institute. The certificate program has proven to be very successful and has helped to meet the needs of local industry. STI hopes that by offering an academic diploma in addition to the certificate that we will be able to enroll additional students and develop graduates who will help meet industry needs.

The basis of the welding program will be built around 20 hours per week of hands on welding experience with supporting welding lecture and General Education classes including: Technical Math, Computer Essentials, and Communication in the Workplace.

The local demand for welders is high, with over 300 openings available in the Sioux Falls Metro area. The wages for welders are excellent, with an average wage of $15.70 in 2010.

Identification and Description of the Program:

STI is proposing to reestablish the one-year Welding Diploma program. The Welding program is designed to provide graduates with the skill to become a successful welder, including the ability to stand for the American Welding Society (AWS) Welding Certification upon completion. The program consists of classes in Welding Theory, Welding Processes, Computers, Mathematics and Communications.

Welding is a repair or fabrication process where metal is joined by melting the individual pieces and adding filler material that creates a weld pool. Once the materials cool and harden, the weld joint is created which provides the finished product.

Objectives and Purpose of the Program:

The primary purpose of this program is to provide a supply of welders for workforce development within the State of South Dakota. South Dakota has a shortage of qualified welders and STI's program will help meet that shortfall.

The objectives of the program include:

- Operate welding equipment safely and develop safe work habits.
- Weld components in flat, vertical, or overhead positions.
- Set up and operate welding or fabrication equipment used to fabricate metal products or assemblies.
- Develop skills in the use of welding jigs, fixtures, weld positioners and other clamp devices used to obtain required configurations and positions for welding.
- Develop the proper troubleshooting, maintenance and preventative maintenance of welding equipment.
- Inspect, measure, or test welded components to ensure conformance to codes or specifications, using measuring and testing equipment.
- Safely operate manual or semi-automatic welding equipment for the gas tungsten arc, gas metal arc, flux-cored arc, plasma arc, shielded metal arc, and resistance welding processes.
- Monitor the assembly, fit-up and welding technique of the welding processes to avoid overheating and distortion of materials.
- Safely set up, and operate hand and power tools, welding, heating and cutting equipment common to the welding trade.
- Lay-out, align, and secure parts and assemblies prior to assembly using straightedges, combination squares, calipers, and rulers.
- Chip or grind off excess weld, slag, or spatter, using hand scrapers or power chippers, portable grinders, or arc-cutting equipment.
- Analyze engineering drawings, blueprints, specifications, sketches, work orders, and material safety data sheets to plan layout, assembly, and welding operations.
- Weld separately or in combination using aluminum, steel, iron and other alloys.
- Determine required equipment and welding methods, applying knowledge of metallurgy, geometry, and welding techniques.

Methods of Attaining the Objectives of the Program:

Upon receipt of the State Board of Education approval, Southeast Technical Institute will accept up to 23 students beginning in the Fall Semester of 2012. The marketing campaign to recruit students will include web, print and radio spots.

The one-year Welding Diploma program will consist of classes in Welding Theory, Welding Processes, Mathematics, Computers and Communication. The students will receive an extensive amount of laboratory time in welding to develop their skill and prepare them for the AWS certification exam.

The Welding Program will be offered traditionally, during the day, at STI.

During the development of the Welding program, STI has worked with several individuals in the manufacturing industry and is building off of its current Welding Program offered through STI's Training Solutions Institute. STI will utilize the existing welding advisory board to help assist in the refinement of curriculum.

Description of Labor Market Demands of the United States, State of South Dakota, Student Needs, and Industry Support

National Data

According to the 2008 – 2018 Bureau of Labor Statistics there will be a decrease of 3,800 positions nationally or a 7.1% decrease for Welding, soldering, and brazing machine setters, operators, and tenders. In addition, there will be a decrease of 6,700 positions nationally or a 1.6% decrease for Welders, cutters, solderers, and brazers. Southeast Tech feels that national numbers do not accurately reflect the regional demand for welders.

State/Regional Data

According to the 2008 – 2018 Bureau of Labor Statistics there is an expected increase of 40 positions regionally or an increase of 12.5% in the need for Welding, soldering, and brazing machine setters, operators, and tenders. In addition, there will be an increase of 415 positions regionally or an 18.9% increase in the need for Welders, cutters, solderers, and brazers. Finally, current information from the Bureau of Labor Statistics shows there are 313 job openings for the Sioux Falls MSA and 1,810 job openings for the East River area of South Dakota. Data shows that current regional positions are exceeding projections.

Student Needs

This program will provide students with an opportunity to enter an expanding industry that has many different entry points, areas for growth, and training that meets industry need and also helps the student in their preparation for the AWS certification. The program provides a background in theory, processes, and general education.

Population to be Served by the Program:

Southeast will recruit students from a variety of backgrounds, including both traditional and non-traditional. It is anticipated that this program will attract students directly out of high school in addition to those who are unemployed, underemployed and those wanting to make a career change.

Program Capacity

Starting Semester	Delivery Format	Capacity
Fall 2012	Traditional Day	23

Projected Three-Year Budget Plan

BUDGET PROJECTIONS			
Year	2012-2013	2013-2014	2014-2015
Salaries/Benefits	$132,942.00	$135,600.00	$138.312.00
FTE	2.0	2.0	2.0
Staff Travel	$1,500.00	$1,500.00	$1,500.00
Instructional Materials	$75,750.00	$77,265.00	$78,810.00
Capital Equipment	$150,000.00	$100,000.00	$50,000.00
Software/Books/Fees	$4,000.00	$4,100.00	$4,200.00
Totals	$364,192.00	$318,465.00	$272,822.00

Salaries/Benefits/FTE/Equipment

The Welding Program currently has one full time instructor. This program would add an additional full time lab specialist and provide for $20,000.00 of part time support. The current welding certificate program from Training Solutions provides for 12 students. Expanding the program to 23 students would require $150,000.00 in additional money for FY 13 and an additional $150,000.00 over the next two fiscal years.

In addition to the proposed Certification and Diploma welding programs, STI offers up to four evening/weekend classes per year. These classes allow incumbent workers the ability to build upon existing skills, or add new skills to improve employability. In calendar 2011, 30 welders received training under this type of programming.

Southeast Tech also operates an AWS Approved Test Facility (ATF). This enables STI to serve local and regional industry partners by offering training and AWS certification for those seeking verification of skills and credentialing. Through this ATF, STI issues approximately 100 AWS certifications annually.

Program Competencies and entry and exit points of sub-occupations:

Program Competencies are based upon the existing Training Solutions Institute Welding Program which provides students with over 600 hours of welding experience over one year with a culmination of sitting for the AWS Certification exam when completed.

Positions identified by the SD Department of labor include the following:

SOC Code	Standard Occupation Classification (SOC) Title
51-4121	Welders, Cutters, Solderers, and Brazers
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders

Statement of non-duplication:

Southeast Tech currently has a Certificate Welding Program through Training Solutions Institute and has never officially closed their Diploma Welding Program. STI understands that there will be other Welding Programs offered in South Dakota, but feels that the regional need will outweigh any conflicts with other Technical Institutes. This program also differs from other regional programs in that it offers the opportunity to obtain AWS certification.

Curriculum Design and Research:

Semester	Course Title	Credits	Lec/Lab
First			
WLD 101	Welding Theory I	2	2/0
WLD 102	Welding Theory I Lab	1	0/2
WLD 103	Welding Processes I	2	2/0
WLD 104	Welding Processes I Lab	6	0/18
MATH 104	Technical Math	3	3/0
SSS 100	Student Success Seminar	2	2/0
		16	
Second			
WLD 151	Welding Theory II	2	2/0
WLD 152	Welding Theory II Lab	1	0/2
WLD 153	Welding Processes II	2	2/0
WLD 154	Welding Processes II Lab	6	0/18
WLD 155	AWS Certification	2	2/0
CIS 101	Computer Essentials	2	1/2
COMM 102	Communications in the Workplace	3	3/0
		18	

Course Descriptions:

WLD 101 – Welding Theory I – 2 Credits

This course provides the lecture portion for basic welding and welding inspection including: safety, welding terminology, welding setup, use of test equipment, weld types, joint design, defects and discontinuities. This foundation course will teach the student how to determine weld quality and proper weld design.

WLD 102 – Welding Theory I Lab – 1 Credit

This course provides the lab portion for basic welding and welding inspection including: safety, welding terminology, welding setup, use of welding equipment, weld types, joint design, defects and discontinuities. This foundation course will teach the student how to determine and test weld quality and proper weld design.

WLD 103 – Welding Processes I – 2 Credits

This course provides the lecture portion for introductory welding processes. This course will introduce students to Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW). Students will learn the safe and proper operation of SMAW and GMAW welding equipment, welder set-up, wire selection and proper welding techniques.

WLD 104 – Welding Processes I Lab – 6 Credits

This course provides the lab portion for introductory welding processes. This course will introduce students to Shielded Metal Arc Welding (SMAW) and Gas Metal Arc Welding (GMAW). Emphasis will be put on proper welding technique, weld quality and execution of proper joint design.

WLD 151 – Welding Theory II – 2 Credits

This course provides the lecture portion for advanced welding and welding inspection including: safety, welding terminology, welding setup, use of test equipment, weld types, joint design, defects and discontinuities. This developmental course will teach the student how to determine and test weld quality and proper weld design.

WLD 152 – Welding Theory I Lab – 1 Credit

This course provides the lab portion for advanced welding and welding inspection including: safety, welding terminology, welding setup, use of test equipment, weld types, joint design, defects and discontinuities. This developmental course will teach the student how to determine and test weld quality and proper weld design.

WLD 153 – Welding Processes I – 2 Credits

This course provides the lecture portion for advanced welding processes. This course will add Flux Core Arc Welding (FCAW) and Gas Tungsten Arc Welding (GTAW). Students will learn the safe and proper operation of FCAW and GTAW welding equipment, elder set-up, and proper welding techniques.

WLD 154 – Welding Processes I Lab – 6 Credits

This course provides the lab portion for advanced welding processes. This course will add Flux Core Arc Welding (FCAW) and Gas Tungsten Arc Welding (GTAW). Emphasis will be put on proper welding technique, weld quality and execution of proper joint design.

WLD 155 – AWS Certification – 2 Credits

This course provides the students with the knowledge and skill to meet the requirements of the AWS Certification test. The course will allow the student to register for the exam, provide the students with welding time, testing, and verification of the quality of the weld.

COMM 102 – Communication in the Workplace – 3 Credits

Presents the elements of oral and written communication necessary to succeed in today's workplace. Emphasizes the written and oral skills needed for job search and employment. Hands-on activities and collaborative projects will provide students with comprehensive information addressing essential writing, speaking and listening skills necessary to excel in today's workplaces as well as the workplace of tomorrow.

MATH 104 – Technical Math – 3 Credits

This course provides students with an introduction to technical math. Topics will include basic math, measurements and an introduction to algebra. This course will be taught by applying math concepts to technical problems.

CIS 101 – Computer Essentials – 2 Credits

This course is designed to enable students with little or no computer experience to acquire a basic understanding of the personal computer. This course involves the study of computer basics such as hardware, operating systems and file management, using the Internet for research, word processing and spreadsheets.

SSS 100 – Student Success Seminar – 2 Credits

This course provides students with tools and techniques that will help them be successful in their program of study. The course focuses on interactive exercises with will help the learner identify personal strengths, learning styles, and support resources. Reading and study techniques will also be practiced.

Wage Factor

Data from the South Dakota Department of Labor puts the 2010 average hourly wage from $14.84 to $15.70 for Welders, cutters, solderers, and brazers. The 2010 average hourly wage was $15.41 for Welding, soldering, and brazing machine setters, operators, and tenders. See Table Below:

South Dakota Department of Labor Data			
Position	**Region**	**2009 Avg Wage**	**2010 Avg Wage**
Welders, Cutters, Solderers, and Brazers	Sioux Falls	$15.28	$15.70
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	Sioux Falls	$15.20	n/a
Welders, Cutters, Solderers, and Brazers	South Dakota	$14.70	$14.84
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	South Dakota	$15.18	$15.41

Data from the National Department of Labor puts the 2008 Median annual wages from $31,610.00 to $33,560.00 for jobs within the Welding Industry. See Table Below:

National Department of Labor Data		
Position	**Employees 2008**	**2008 Average Yearly Wage**
Welders, Cutters, Solderers, and Brazers	412,300	$33,560.00
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	54,100	$31,610.00

Appendix A – Letters of Support

Gregory Johnson, Manager South Dakota Department of Labor and Regulation

south dakota
department of labor

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Fax: 605.367.5308
www.sdjobs.org

December 19, 2011

To Whom It May Concern:

The Department of Labor and Regulation (DLR) has been informed Southeast Technical Institute, Training Solutions is preparing a proposal to expand welding curriculum to South Dakotans. This includes providing additional levels of training, certification, and degree programs to individuals in the Sioux Falls region who are seeking welding classroom and lab instruction.

I am writing in support of this proposal and application for resources to accomplish these goals. My understanding is the proposed program changes include two educational options to the students:

1. The first would be an expanded Certificate level program which would look much like the program STI currently offers. Students will work in the classroom and lab with the additional goal of obtaining AWS welding certification.
2. The next level would be a Diploma level program. This would include all programming included in the welding certificate program, plus the general education courses required to fulfill State diploma criteria.

DLR is aware of the employment opportunities in our state requiring welding education from basic to specialized skills. We strongly support Southeast Technical Institute, Training Solutions' efforts and proposal to expand and broaden their curriculum and opportunities to students.

The ready availability of trained welders at all skill levels has a direct impact on our business community's economic success, and is important to the chain of economic development in the manufacturing business community. Please do not hesitate to contact us if you need further assistance.

Sincerely,

Gregory Johnson, SPHR
Manager South Dakota Department of Labor and Regulation, Sioux Falls local office