



TALENT
INSPECTION GROUP

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October 29, 2013

Industrial Commission of North Dakota (Oil and Gas Research Program)
Ms. Karlene Fine, Executive Director
State Capital, 14th Floor
600 E Boulevard Ave Dept 405
Bismarck, ND 58505-0840

Dear Ms. Fine:

This addendum has been created to respond to the NDOGRP committee's feedback from our initial application. The addendum will reveal Industry Intent, Clarification on how TIG's project fits into the Mission and Statutory Goals and Purpose as well as a reduced budget request for the initial phase.

As a recap, the original request requested the Industrial Commission to partner with TIG in the innovation and deployment of pipeline inspection. The project will use a combination of Unmanned Aerial Systems (UAS) and industry specifically designed sensor technology boxes to provide inspection services on the pipeline.

In the past the sensor technology boxes (Payloads) have been overlooked in this project. It is important to clearly define the sensor technology being discussed. An industry specifically designed sensor box will include sensor technology that senses the types of components that the industry partner requests. There are very few limitations on the sensors. Sensors can be used to detect encroachments and leaks as well as sensors that are designed to detect temperature or saturation. The innovation in this case is the combination of sensors that will be deployed in 1 payload unit that is fixed to the UAS or a fixed wing aircraft. As the initial data is collected and analyzed new information will lead to new sensor combinations to be deployed and more data will be collected and more technical development will be activated.

The data obtained through this process delivers, a new perspective on inspecting pipelines. We are launching new technology in this area that will lead to additional innovations and projects. Industry will now be given better targeted data to continue to practice sound environmental exploration as the resource is shipped through the pipelines. The technology can compare year over year season over season any changes that are detected and identify and trending patterns that need to be addressed before they reach a critical status. This technology in its sensing and preventative approach helps to reduce the environmental footprint of capturing the resource.

The benefit of this activity is not limited to environmental footprint reduction it also expands out to positive public relations. The peace of mind this project offers the public is in knowing that industry has the tools to collect the data this innovation provides to stay ahead of potential disaster.

The project includes the creation of several technical jobs throughout the state. Positions will be created to tap into the UAS pilot pool of candidates being educated at UND, Computer programmers and Database developers will be brought on to decipher the sensor data and provide meaningful reports to industry partners, systems analysis positions will be used to define new requirements identified through industry requests or through the analysis of historical trends noticed in the data. Marketing and Sales teams will be working at growing industry support and desirability of the project. These positions are not limited to only oil producing counties.

Industry's support and interest in this project is illustrated by the letter of support included in this addendum. As summarized in the letter of support from Bakken Link, Industry is looking to leverage new technologies that enhance and reduce the cost of pipeline inspection. Pipeline inspection is something that they must do and these

advances in sensor technology will aide in their ability to fulfill this requirement while meeting their operational goals.

Based on the committee's feedback from the first submission the budget ask of the industrial commission NDOGRP has been reduced from 325k to 125k . Talent Inspection will be making up the difference of the 200k in their own contribution. This decision to move forward with a reduced ask has been encouraged by both industry and university partners that will play an active role in the team that deploys the new technology. Please see the attached revised budget document for the specific reductions.

As conveyed in our initial application, we are very much looking forward to being one of the many companies that are delivering new technologies that will result in a positive impact to our oil and gas industry and the communities in which we live. I am available for questions and clarification, please feel free to contact me zach@talentinspectiongroup.com.

Sincerely,

A handwritten signature in black ink, appearing to read 'Zach Lamma', with a horizontal line extending to the right.

Zach Lamma, President

Phase I: Technology/UAS Implementation

	Costs	Original Request (NDIC)	New Request	Additional TIG	Original TIG
Tetracam MCA 6 Channel	15,000.00	7,500.00	2,884.62	4,615.38	7,500.00
HD Block Camera	1,500.00	750.00	288.46	461.54	750.00
Flight Ready PC	2,500.00	1,250.00	480.77	769.23	1,250.00
Fasteners/Components/Wires	3,000.00	1,500.00	576.92	923.08	1,500.00
Technology/Research/Innovation	353,000.00	176,500.00	67,884.62	108,615.38	176,500.00
Sensor Testing	125,000.00	62,500.00	24,038.46	38,461.54	62,500.00
Report and Regulatory Analysis	150,000.00	75,000.00	28,846.15	46,153.85	75,000.00
Total Phase I	650,000.00	325,000.00	125,000.00	200,000.00	325,000.00

BakkenLink

BakkenLink Pipeline LLC

2101 46th Ave SE, Suite 2 • Mandan, ND 58554

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October 31, 2013

Zach I Lamppa
TALENT Inspection Group (TIG)
4141 38th St. SW, Suite 2A
Fargo, ND 58104

Mr. Lamppa,

Per our discussions related to your proposal for Unmanned Aerial Survey of pipelines, I believe the concept is sound and would be a welcome addition to our options of pipeline surveillance.

As you know, we survey our pipeline for leaks, right of way conditions, and encroachment on a frequent basis. The potential for aerial surveys via unmanned aircraft is a very intriguing concept as the aircraft could be equipped with various monitoring devices.

Currently, BakkenLink is utilizing aerial patrols every two weeks at a substantial cost. Should this technology become available, reliable, and cost effective it would enhance our options and ability to perform our patrols. BakkenLink currently has 95 miles of pipeline with plans to expand this as opportunities present themselves. We are currently looking at an additional approximate 100 miles of pipeline opportunities.

This technology would allow industry the ability to quickly and cost effectively perform leak survey patrols, and depending upon the availability, could result in more frequent patrols thus enhancing industry's ability to more quickly find and respond to any potential leaks.

As leak detection technology advances and could be mounted on an unmanned aircraft, industry would have more options and abilities in finding leaks. This could lead to enhanced operational safety of all pipelines.

BakkenLink Pipeline LLC is interested in this concept and would be willing to participate in any testing you may perform during your research and development phase. I envision the testing phase to consist of flying our pipeline, recording data via recording devices and testing various leak detection methods while verifying the data by traditional inspection methods.

Please keep us informed on your progress as your research and development phase continue.

We look forward to working with you to bring this concept to fruition in the advancement of options of keeping our pipeline infrastructure safe through diligent monitoring.

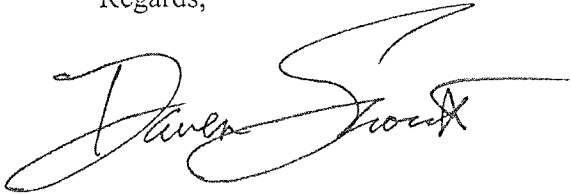
BakkenLink

BakkenLink Pipeline LLC

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Regards,

A handwritten signature in black ink, appearing to read "Darren Snow". The signature is stylized with a large, sweeping initial "D" and a long horizontal stroke extending to the right.

Darren Snow, PE
Vice President
BakkenLink Pipeline LLC



TALENT
INSPECTION GROUP

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zach@talentinspectiongroup.com

August 15, 2011

Industrial Commission of North Dakota (Oil and Gas Research Program)

Ms. Karlene Fine, Executive Director

State Capital, 14th Floor

600 E Boulevard Ave Dept 405

Bismarck, ND 58505-0840

Dear Ms. Fine:

First of all, the team working on TIG Pipeline Inspection Phase I project would like to thank the North Dakota Industrial Commission and Oil and Gas Research Program for supporting initiatives like ours. The work being performed by your organization ensures that the development of our oil and gas resources is in the best interest of our communities within the state of North Dakota. Thank you for taking the time to review our application and we look forward to partnering with you.

TIG Pipeline Inspection Phase I

The focus of this grant application and request for matching funds is the introduction and use of advanced sensor equipment into the oil and natural gas marketplace in the state of North Dakota. Through this process Unmanned Aerial System (UAS) technology will also be introduced as a means to collect the data on the pipelines. While this technology is developed fixed wing aircraft may also be used to deliver the data collection technology. TIG will deliver a solution deploying innovative sensor technology to detect leaks and anomalies in pipelines before they become a concern on the surface or underground. Advanced comparable data will be made available to industry and North Dakota communities where better decision making can be encouraged. TIG will provide better data comparisons in order to facilitate better decision making in regards to pipeline inspection. This initiative is important as Pipeline Integrity is on the forefront of issues and concerns for stakeholders involved in the delivery of this resource generated within the state of North Dakota.

It is expected that federal Department of Transportation mandates associated with pipeline integrity will be further imposed on DOT regulated pipeline companies, deeming this technology necessary. Furthermore the partnerships assist in establishing guiding principles of what can and cannot be monitored, therefore pioneering reporting standards in regards to pipeline integrity.

This transmittal letter represents a binding commitment by TIG to complete the goals described in this proposal and become an industry leader of providing solutions that help pipeline companies fulfill their legal and social responsibility in a safe and economical manner.

Enclosed you will find our completed application and supporting documents. We look forward to working with you and are excited at the opportunity to have our innovation make a difference. I am available for questions and clarification, please feel free to contact me zach@talentinspectiongroup.com. Sincerely,

A handwritten signature in black ink, appearing to read 'Zach Lamma', with a horizontal line extending to the right.

Zach Lamma, President

Oil and Gas Research Program

North Dakota
Industrial Commission

Application

Project Title: TIG: Pipeline Inspection Phase I

Applicant: Talent Inspection Group (TIG)

Principal Investigator: Zach Lamppa

Date of Application: August 15, 2011

Amount of Request: \$975,000

Total Amount of Proposed Project: \$2,275,000

Duration of Project: 3 Years

Point of Contact (POC): Zach Lamppa

POC Telephone: (612) 220-1092

POC E-Mail Address:

Zach@talentinspectiongroup.com

POC Address:

8419 Cerechon Blvd Duluth, MN 55803

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ABSTRACT

Objective:

Through TIG's data collection process historical data will be made available to North Dakota energy companies allowing them to become more active in the management of their neighboring pipeline. TIG's technology will be leveraged to provide proof of responsible pipeline management and prevent disasters from occurring. This technology will provide the oil and gas industry with cost effective reliable pipeline inspection technology that enable them to meet safety and environmental inspection requirements by the end of year 3.

Expected Results:

New technology will be developed to improve the affordability and frequency of pipeline inspection. A repository of comparative data will be built and made available to enhance the reporting capabilities of the technology. North Dakota communities that allow pipelines to flow through their backyard will be able to request more frequent pipeline inspections. As the technology evolves deviations in the images will be captured and noted. The system will develop a series of alerts and responses that will aide in faster response and reduce the cost of the environmental impact. For example, slight erosion may be detected on the initial data collection mission but on the collection mission 3 months down the road major erosion near the pipeline is detected. The comparison of the two data sets kicks in the alert that says someone better inspect this area of the pipeline before a spill occurs. Through the partnerships and alliances TIG has formed, the opportunity exists to aide in setting industry safety standards by uncovering additional ways to measure integrity and providing the solution to industry regulation. The project defined will be to develop the technology that can be flown over pipeline either through an unmanned aircraft or with traditional fixed wing. The box will collect the data that will be processed into reports and shared with key stakeholders from North Dakota communities, Industry and governing bodies which can be used to aid in their analysis of the integrity of the pipeline. It will become North Dakota community's responsibility to demand more from industry as it aligns with Pipeline and Hazardous Materials Safety Administration (PHMSA) top concerns. TIG's technology will be the industries solution to this problem.

Duration: Phase I (\$650,000) of the Pipeline Inspection project for TIG is expected to be concluded at the end of Year 1. Phase II (\$650,000) concluded at the middle of Year 2. Phase III (\$650,000) concluded at the end of Year 3. Phase IV (\$325,000) Concluded simultaneously Year 3 **Total Project Cost:** \$2,275,000.

Participants: Zach Lamppa, President , Jack Norqual, Private Investor, Chief Manager, 12 West Partners, LLC, Mark Hastings, Director, VP of Operations, Taylor Butterfield, Project Manager, Dr. Will Semke, UND, Technical Officer, Aleks Udris, Bold Method, LLC, Data and Reporting Services, I.D.E.A. Center, Dan Heldt PE, Pipeline/Utilities Group Manager; LHB Corp., Advisory Board and Operational Support

PROJECT DESCRIPTION

Objectives:

Our project proposes an advanced method for monitoring ruptures and leaks to ensure the safety of ND communities.

TIG has provided the pipeline and utility industry with quality construction management, safety/craft inspection and pipeline surveying since 2009. TIG in partnership with UND will expand and deliver innovative technology that will be used to monitor and report pipeline integrity data. North Dakota in an effort to secure environmentally sound oil/natural gas exploration and transportation for its communities will join forces with TIG initiating data collection and reporting on pipeline integrity. This joint effort responds to the US Department of Transportation Pipeline and Hazardous Material Safety Administration (PHMSA) in accomplishing a key objective on their plate, a call to action to that will allow operators make critical decisions that could stop a pipeline leak or rupture before it harms people or the environment.

TIG will expand on the inspection services already offered and will develop a technology that will be customized to specifications enabling the data collection to be performed with an Unmanned Aerial System (UAS) or fixed wing aircraft allowing for a safe, effective and affordable method of collecting data. It is anticipated that the industry will become more comfortable with the data readings and UAS that the technology will migrate to primarily UAS resulting in less expensive more frequent data checks over the North Dakota pipelines. The increased frequency will help to prevent and/or reduce the size of possible spills, as a result the footprint of oil and gas activities will be minimized and environmentally favorable. Data that is collected and analyzed over time will provide the industry with new intelligence that will act as first indications of possible issues. Safety, efficacy and cost savings will be realized through early detection of erosion, soil saturation, environmental factors as well as other measurements.

In addition to providing a more affordable method, the key objectives that will be to build a data repository that will become a baseline of information that will lead the industry in sample comparisons that may be used in other states or other applications. This will be a smart system that will continue to evolve as new scenarios become available for analysis, i.e. joint fractures in snow vs. joint fractures in dry land.

Methodology:

TIG: Pipeline Inspection Phase I can be broken down into 8 major components: technology, repository build, UAS or Fixed wing application, data mining, alerts, reporting, clients, and industry standardization. The data mining and reporting will follow the "agile" development model allowing iterative updates to project functionality as the project matures. Steps include Requirements definition, Analysis, Design, Coding, Testing and Delivery/Installation.

Technology: Several monitoring and pipeline inspection measurements have been identified as first priority to be developed for this purpose. Sensor examples include: Image Resolution, Thermo Sensory, Spectral Bands, Telemetry, Data Analysis, Encroachment, Spill, Excavation, Fire, Flood, and Erosion. The first priority sensors will be used to demonstrate capabilities and begin to influence industry standardization and regulation. During the technology development phase it is anticipated the technology be first introduced on a fixed wing aircraft and upon size regulation achievement later implemented on UAS.

Repository Build: To enhance the technology and develop the smart brain within the application a repository of comparative data must be developed. Data will be developed to identify the indicators of fire, oil spills, erosion or unsafe activities such as digging next to pipelines. The Repository will be an evolving library of samples to be used to compare in flight images or sensors. The technology team is committed to locating or building these samples thus developing that baseline information that will lead to other projects.

UAS Application: Once the technology proves out that the sensors are picking up their intended information work can begin on fitting all technology into an X pound box where X represents the weight limits of the intended UAS model. Testing will resume and be compared to earlier test flights to guarantee same results are achieved as in the non-miniaturized technology.

Data Mining: The work of the technology and UAS device is to collect data and provide it in a file that can be further processed and made available to stakeholders. During the Data Mining phase the file will be received and then scrubbed for accuracy and translated into a usable report format. This mining process is important to guarantee data integrity in the alerts and reporting that will follow. A system administrator will accept or reject the file as well as perform any maintenance activities necessary for a healthy database.

Alerts: Through the R&D process and partnerships, sensors will be asked to pick up critical information that may need to be sent in the form of alert ASAP to prevent compromising the pipeline. For example if someone is digging in their field to close to the pipeline an alert will be sent so that officials can take appropriate action. The process of defining these alerts and managing who needs to be alerted will be a system all in its own.

Reporting: Again the partnerships formed will play a critical role in defining report needs. TIG expects that sample reports with collected data will be generated. Phase II of these reports will be tailored to each respective client's needs.

Clients: Working closely with the TIG network and pipeline operators affected by pipeline safety requirements the client base will grow. Sample reports will be used to illustrate value add and TIG will work with the clients to schedule inspections according to each client's needs. This process will include identifying the first phase partners that will help to standardize reporting for each of the sectors, pipeline operator, pipeline inspector, etc.

Industry Standardization: Often times with regulation the regulation comes first and then the means to measure the compliance comes second. TIG wishes to drive the measurement of compliance by making technology available to sense things that otherwise would not be measurable. Through the successful implementation of providing data to the pipeline stakeholders TIG will instill social responsibility to do the right thing within the industry and that is to inspect to keep our industry safe and viable.

Anticipated Results:

Technology provided will inspect the close to 7,000 miles of transmission and distribution pipelines in ND. The miles of transmission and distribution pipeline will be subject to mandates governed by the Department of Transportation Pipeline and Hazardous Material Safety Administration. Currently DOT PHMSA requires inspections to be flown at least 32 times per year. The Enforcement and Safety Act was passed improving safety programs. As our pipelines continue to deliver this valuable resource they will be susceptible to added regulation. It is anticipated that these legislative agendas will increase the inspection requirements as the risk of additional leaks increase and the communities bring forth the demand to provide even safer pipelines. TIG's technology will be in place to serve that need.

Results will be seen. If one speculated that 10-60% of the oil spills reported by Exxon as an example were sensed by geo thermo imaging, ground penetrating radar, that would mean that TIG's technology would have been able to prevent or reduce the community impact of those recorded spills. According to Exxon's data 2.2-13.3 million would have been saved and over 30,000- 175,000 gallons protected from polluting the environment.

The ground penetrating radar sensor technology will be able to sense unapproved excavation or survey stakes and flag placements thus reducing the amount of possible rupture or leaks to the pipeline. This close monitoring will also offer community ranchers comfort in that livestock will not be falling into eroded areas.

The Pipeline Inspection, Protection, Enforcement and Safety Act has placed a priority on collaborative programs that secure safety, incident and risk management, integrity, consequence, detection and vulnerability at project and national levels. TIG's Technology is being designed and implemented to address all of these high profile concerns from this safety industry and for our ND communities impacted.

Facilities:

TIG will be establishing an office in North Dakota and UND in Grand Forks will be a key component in technology development and a talent pool. Fargo will be a key component in the data mining portion of the project as well as Bismarck which is close to the pipeline and legislative agendas as well as home to the IDEA Center. The budget allows for the necessary facility expense and transportability required to fulfill the project needs.

Resources:

The sensor technology and UAS deployment will be performed at UND. The data mining alerts and reporting will be performed by Bold Method, LLC. The analysis and industry awareness will be executed by TIG. Assistance with the development of the project will be guided by industry experts and the IDEA Center. Matching funds will be provided by private investment, 12 West Partners LLC, Jack Norquai (Appendix).

Techniques to Be Used, Their Availability and Capability:

The new technology will be developed at UND will include the data collection, comparison and processing. This technology is proven and available but needs to be brought together in an innovative way to UAS specification to be applicable for this implementation. Once the data is collected typical data processing routines will be developed to make the data available for the stakeholders in report formats that are customizable to them. The processing routines will include scrubbing, translating

codes, serving up images and videos, reporting alerts, scheduling runs and long term making recommendations on actions. TIG's network will be first to be engaged and through those partnerships R&D will evolve according to AGILE methodologies.

Environmental and Economic Impacts while Project is Underway:

Pipeline Operators face increasing pressure from legislation to meet stricter and stricter federal mandates, to preserve pipeline assets, and to protect the public from negative environmental outcomes. Technology solutions such as TIG's data capturing need to be developed to aide in collecting, maintaining, and integrating pipeline data to implementing risk assessment, mitigation, and accident control. TIG will offer innovative and time-tested solutions to managing integrity that balance multiple needs for GIS and asset maintenance consulting, spatial data development, and pipeline software. TIG will work closely with the DOT, as well as the Petroleum and Hazardous Materials Safety Administration (PHMSA) on regulations and congressional hearings on the future of pipeline integrity management.

The environmental impact will be realized during the test flights that will be conducted while the technology is developed. Data will be collected and observations will be made. For example, perhaps the test reveals a particular level of soil saturation at a percentage above normal. TIG will be in communication with the corresponding pipeline maintainer and perhaps request a PIG to be sent down the pipe to assist in detecting a fractured weld or pitting that has caused a leak below the surface. The result will be to catch the problem before it worsens. This data will then be stored for later comparison indicating what the inspection revealed, what the PIG revealed and how it translated into what action needed to be taken. The more test flights, the more data, the faster the reaction time. An example of what the economic and environmental impact can be summed up with data on Exxon Mobil. Since 2002 Exxon has spilled 291,748 gallons of crude oil/refined petroleum products into the environment from its facilities and pipelines. This totals a combined cost of \$22,149,100 in fine. Exxon could potentially be a customer as we develop our proof of concept that we can detect leaks through geo-thermal imaging and ground penetrating radar while utilizing technology during dull, dirty and dangerous missions over areas where pipelines are located. In July of 2011 some 42,000+ gallons of crude oil leaked into the Yellowstone River from a 20 year pipeline that was last inspected in 2009 by Exxon.

"An accident that should have been prevented is not really an accident. Tragedies like the Yellowstone River spill can be prevented by strong safety regulations and the proactive action of regulators. Today we are in desperate need of both" (Anthony Swift, Natural Resource Defense Council)

The Economic impacts go beyond the planned 30 plus positions that will be employed at TIG. Through preventing and detecting pipeline issues funds that are currently being spent on clean up efforts will be dispersed into our communities in other ways. Those in our North Dakota Communities that are impacted by the spills will have reduced recovery times or no recovery times due to prevention measures. North Dakota faces an out migration of its youth. The technical positions created at TIG will be attractive careers for those wanting this type of experience where as today; this industry is limited in its offerings. By leveraging UND's certificate of authorization in the UAS field TIG is able to establish a track record of performing this service with a global leader in relevant sensor development. Only one other institution in the US is able to obtain certificates of authorization and that is the University of New Mexico. Additional states have pipelines that need inspections, the key to our economic development is to develop innovative technology that other entities will pay for and bring those dollars back to North Dakota to develop more jobs and an industry leader in pipeline monitory and integrity management.

Ultimate Technological and Economic Impacts:

The Data provided by TIG to the North Dakota communities and industry partners will result in better management of pipeline integrity and reduce pipeline shutdown, keeping the resource flowing safely. Jobs will be created to assist in providing the data to the stakeholders and to continue to develop and launch new sensor technology. This North Dakota lead effort will have 3 solid years on becoming an industry expert utilizing this technology with its specialized delivery method prior to the delivery method becoming available outside of COA constraints. The partnership between UND and TIG guarantees that knowledge will be fine-tuned and able to provide the service to surrounding states. We can then bring back that economic impact in forms of new jobs and continued R & D to TIG facilities here in North Dakota. TIG plans on providing 6 North Dakota jobs immediately with additional site crews added as we start field testing , Spring of 2012. UND will also see an immediate impact with white papers and industry awareness that TIG and UND are working in conjunction with the same goals and timeframe.

Why the Project is needed:

"We have redefined how to look for oil and gas," says Rehan Rashid, an analyst at FBR Capital Markets. "The implications are major for the nation." North Dakota is a major part of this equation with its Bakken and Three-Forks Shale formations. We want to provide technology that will ensure the viability of this region for years to come through safe, accurate and cost effective integrity management of pipelines carrying this valuable product to market.

A new drilling technique is opening up vast fields of previously out-of-reach oil in the western United States, helping reverse a two-decade decline in domestic production of crude. Companies are investing billions of dollars to get at oil deposits scattered across North Dakota, Colorado and Montana. By 2015, oil executives and analysts say, the new fields could yield as much as 2 million barrels of oil a day – more than the entire Gulf of Mexico produces now. By 2020, oil imports could be slashed by as much as 60 percent. At today's oil prices of roughly \$90 per barrel, slashing imports that much would save the U.S. \$175 billion a year. Last year, when oil averaged \$78 per barrel, the U.S. sent \$260 billion overseas for crude, accounting for nearly half the country's \$500 billion trade deficit.

TIG will be playing a major role through its pipeline integrity management of guaranteeing that North Dakota is doing all that it can to handle the volume of oil moving through its state as safely as possible. The partnership with TIG, North Dakota, PHMSA, FERC, EPA and DOT will establish a communication channel that will keep and encourage the entities proactively planning instead of reactively responding.

The project proposed by TIG is an answer to policymaker's dilemma where they are required to mandate stricter regulation sometimes before technology is developed. Somewhere in the space between stricter regulation and implementation of compliance lies the innovation being presented by TIG in this project.

According to the North Dakota Pipeline Authority website North Dakota oil production went from a mere 3,000 barrels a day in 2005 to over 350,000 in 2011. Thanks to hydraulic fracturing or "fracking" and stable oil prices oil production in the Bakken has exploded. EIA thinks North Dakota will produce over 1,000,000 bpd by 2015. Ron Ness, president of the North Dakota Petroleum Council, said about 650 new wells were drilled in 2010. He expects up to 2,000 new wells in 2011, which would double the number of Bakken and Three Forks wells from 2010. This resource needs to be transported responsibly. Establishing strategic partnerships with pipeline companies such as Enbridge, ONEOK and Trans Canada, government officials, land owners and community members and providing these key stakeholders with the data that grants peace of mind that all is well on the western front is where TIG will play a role in ensuring that the infrastructure needed in North Dakota will be monitored safely and cost affectively.

In summary, the doubling of the mentioned production levels lends itself to concerns associated with pipeline integrity. Requirements in pipeline integrity and remediation as set forth by the Department of Transportation's Pipeline and Safety of Hazardous Material Administration (PSHMA) set forth new standards in pipeline safety. These requirements and mandated increase in expenditures demonstrate the need to provide industry with more affordable and dependable ways to monitor pipeline throughout North Dakota. Comments made this past December 2010 in docket number RM10-25-000 with the Federal Energy Regulatory Commission in regards to pricing index of oil ceilings were quoted as "compliance with the integrity management regulations is likely to be the largest single variable cost item for most pipelines and these costs show no signs of decreasing."

TIG's solution will address several key issues industry faces and impact the cost and method that pipeline integrity is inspected. The solution will aide in promoting efficient, economic and environmentally sound transportation of oil and natural gas within the state of North Dakota. Data will be collected, a repository will be built and information will be shared that will assist key stake holders in educating the public, early awareness of issues, and disaster preventative measures. The flexibility of the data collection technology design lends itself to fixed wing aircraft deployment and eventually the implementation of UAS technology fosters job creation for UND's graduates focused in this field of study as well as competent individuals relocating to North Dakota due to the huge growth opportunities. The time to invest in this private public partnership is on target with the passing of Federal Aviation Administration Reauthorization and Reform act of 2011 that states that UAS's will be allowed to fly in national airspace by 2015. By beginning phase I now TIG will be ready with the technology and individuals to begin to pass on the safety and cost saving methods to the key stakeholders involved.

STANDARDS OF SUCCESS

Throughout the four phases of the project milestones will be set to ensure phase completion as anticipated. Phase I will begin November 2011 and wrap up December 2012. Phase I will include the data collection technology as is needed for fixed wing or UAS delivery. In the tail end of Phase I analysis has been built in to stay true to the "agile" methodology in order to solicit industry requests for the next phase of innovation to happen with the technology choices going into Phase II. Analysis for reflection and preparation for Phase II will be completed March 2012.

Phase II places a strong focus on developing the data repository that will grow more valuable over time as more data collections take place and add to the system. The extra time reserved for this phase is secured to prepare for proper infrastructure needed in anticipation of this growth. Success here will be measured in that one will be able to compare data dimensionally not just at one level. For example, be able to compare the pipeline next to yesterday's flight on the pipeline. Another example would be to compare the pipeline flight to the last 70 degree day and still one final example is to compare the pipeline data to exactly this time last year where last year indicates data for that time frame has been collected. Furthermore, this phase will deliver a robust method for delivering or pulling reports. Clients and key stakeholders will be allowed to access the data via secure logins allowing strict security access to proprietary data. One will be looking for a solution that is expandable as the sensor technology and client base expands. Phase II will begin October 2012 with wrap up September 2013.

Moving into Phase III the second round of sensors will be enhancing the data collection process. With the infrastructure established pushing this data through the system will occur more rapidly. Analysis of where the new data can be merged with the old will be evaluated. New reports will be made available. By this time TIG will be recording its activities as it relates to prevention of spills. The Data repository will have grown to close to 2 years worth of data for engaged pipelines. Phase III will deliver new sensor technology by September 2014, additional reports by December 2014 and analyze and prepare the next phase of expansion and enhancements by January 2015.

Phase IV occurs throughout the project and is the burden of TIG. TIG will demonstrate success as it relates to all of the phases by its ability to provide resources as the project develops. By 2015 over 30 positions are anticipated to fill the roles within TIG, the 3 million cash injection will be obtained and the target is to engage 70% of pipeline companies transporting via pipeline through North Dakota. Regular findings will be reported to our partner communities and as a whole one can expect a reduction of spills.

There are many ways in which the Public sector will be able to make use of the project's results. UND will use this project as an illustration of public/private funded project initiatives. White papers will be written and submitted to the US Department of Transportation on behalf of the ND Oil and Gas Research Councils partnership with TIG, TIG will be active in participating in forums that drive industry standards in a social responsible way where their solution can make a difference. North Dakota will again be able to demonstrate that investing in companies like TIG makes sense on an economic and socially responsibility level.

In fulfilling the ND Oil and Gas Research Council's mission to promote the growth of the oil and gas industry through research and education it is safe to say that TIG's solution aligns perfectly with both research and education in a state where pipeline infrastructure is booming. Research in that the repository that is built and the sensors that are built will continue to uncover facts that we do not yet know but need to learn about.

BACKGROUND/QUALIFICATIONS

Zach Lamppa- President

Zach has over 10 years of sales/marketing experience and in February of 2011 successfully sold a pipeline field services company that performed work throughout Midwest including North Dakota. Zach has 4 years of pipeline experience and served as Vice President of Clearwater Environmental Services, LLC. Zach recently started TALENT Inspection Group (TIG) in 2009 and believes UAS technology is the future of numerous applications within the pipeline industry. Zach has performed inspection, digs and survey work for such companies as Enbridge, Pecan Pipeline and EOG Resources. Most recently TIG worked on anomaly and integrity pipeline digs for United Piping out of Duluth MN for Enbridge Energy. Change outs and exposure lowering on 36" crude oil line. Supervised digging, locate and read anomalies. Supervised cutting and welding of pipe, coating, X-Ray, backfill and clean up. Measure land damages. Supervised stringing pipe, welding, X-Ray, blasting, coating, drilling, pulling pipe, and tie-ins. Zach has also been working with the University of North Dakota Unmanned Aircraft Systems Research, Education and Training Center and its staff since November of 2010 on future pipeline applications. Zach's UAS knowledge and ability to bring competent industry experienced individuals together will allow TIG to be successful. Zach is a graduate of the University of Minnesota Duluth and recent Labovitz Emerging Entrepreneur of the year nominee 2008. Zach is a hard-working, energetic, visionary that believes will bring the right qualified individuals together to make TIG a long term success.

Jack A. Norqual, Private Investor Residence: Eden Prairie, Minnesota Age: 66. Current occupation: 2000-present, Investments, Venture Capital, Private Equity. Company: 12 West Partners, LLC. Chief Manager. Prior Business Experience: Winthrop Resources Corp. High Tech. equipment leasing Co-Founder in 1982, Public Co. in 1992, Sold to TCF Financial in 1997, Retired in 1999. Dataserv Equipment: Pre-owned IBM equipment, V.P. Sales 1977-1981. Xerox Corp. Sales Executive 6 years. Control Data Corp; Mechanical Buyer, 3 years.

Dr. William Semke-Director of the Unmanned Aircraft Systems Engineering Laboratory. Dedicated to the design, flight test and evaluation of UAS payloads for Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR) military missions as well as civilian and environmental applications related to precision agriculture, atmospheric science research, disaster monitoring and search and rescue. Over the past 4 years the over 50 UND Engineering students under Dr. Semke's guidance have leveraged their electrical and mechanical disciplines to develop remote sensing instruments based on actual end-user requirements.

Mark Hastings -- UAS Chief Pilot . Mark Hastings is the Chief Pilot for Unmanned Aircraft systems for the John D. Odegard School of Aerospace Sciences. He holds a commercial pilot certificate with instrument rating in both single and multi-engine aircraft, CFI, CFII, and MEI. He has provided flight instruction, standardization, and check airman duties in a wide variety of aircraft including the CRJ-200 and King Air C90. His experiences also include integral roles in UND Aerospace employee management and the development and implementation of standard operating procedures. In 2009 Mark completed Operator and Maintenance level I & II certification on the Boeing/INSITU ScanEagle UAS. Since certification he has played a major role in airspace integration research as well as conducting several airborne surveillance missions to assess overland flooding in the Red River Valley. Currently Mark is responsible for the development and implementation of the UAS Operations Course housed under the Unmanned Aircraft Systems Bachelor Degree program at the University of North Dakota.

Taylor Butterfield – Project Manager. Taylor Butterfield is a UAS Lead Flight Instructor for the John D. Odegard School of Aerospace Sciences. He is primarily an instructor on the Boeing/INSITU ScanEagle UAS platform. Taylor graduated from the University of North Dakota in 2009 with a B.B.A in Aviation Management and a B.S. in Commercial Aviation. Taylor is also certified on the AeroVironment Rave-B DDL aircraft in support of a Public Safety UAS project. Taylor worked as the UAS Project Coordinator in the UND UAS Center from March to December 2010. He holds a commercial pilot certificate with instrument ratings in both single and multi-engine aircraft, CFI, and CFII. He has worked for UND Aerospace as a Flight Instructor since 2008 instructing students in Private, Instrument, Commercial Pilot, and Certified Flight Instructor-Instrument Flight Courses. Taylor has also worked as a Flight Instructor for the EAA Air Academy in Oshkosh, Wisconsin and was the President of EAA Chapter 1342 for two years

MANAGEMENT/TIMETABLE

TIG will be pulling in experts in data collection, UAS, pipeline integrity management and regulatory agencies in order to develop an industry worthy solution. Members pulled together thus far include, UND, Bold Method, Venture Capitalist and other industry savvy partners.

The following time table represents the phases that will be project managed to secure successful results. The implementation cycle of the project will have some simultaneous overlaps as new sensor technology releases occur or additional reports are developed. .

	Start Date	Complete Date	Comment
PHASE I: Technology/UAS Implementation			
Tetracam MCA 6 Channel	Nov 2011	Dec 2011	Equipment needed
HD Block Camera	Nov 2011	Dec 2011	Equipment needed
Flight Ready PC	Nov 2011	Dec 2011	Equipment needed
Fasteners/Components/Wires	Nov 2011	Mar 2011	Equipment needed
Technology/Research/Innovation	Dec 2011	Dec 2012	Innovation to be designed and developed
Sensor Testing	May 2012	Dec 2012	Quality Control
Report and Regulatory Analysis	Jan 2012	Mar 2012	Closely monitoring the industry and community needs for the current and future phases
PHASE II: Data Mining/Alerts/Reporting			
Beta Server Setup and Annual Cost	Oct 2012	Dec 2012	Dependent on the sensor data collection file being available for processing
Production Server Setup	Oct 2012	Dec 2012	Dependant on the Beta being solid enough to push forward
Application Architecture and General Build	Nov 2012	June 2013	Initially utilizing test data but working with data to make it intelligent as more files are processed and more data scenarios are collected.
Implementation of Four Sensors	Nov 2012	Aug 2013	Process the data from

			the initial 4 sensors prioritized by TIG. Protect data with security aspects but begin to make available to clients
	Data Views/Reports	Jan 2013	Sep 2013
	Training and Support	Aug 2013	Sep 2013
	Report design, spec Rqs	Jan 2013	Sep 2013
	Publish Reports	Aug 2013	Sep 2013
PHASE III: TIG Research/Expansion			
	Sensor Technology	Aug 2013	April 2014
	Research/Innovation	Aug 2013	April 2014
	Analyze sensor priority	Aug 2013	April 2014
	Implementation of Next Sensors	April 2014	Aug 2014
	Data Views/Reports	July 2014	Sept 2014
	Training and Support	Sept 2014	Dec 2014
	Sensor Analysis Changes	June 2014	Dec 2014

Documentation that go along with views and reports to help explain apples to apples and keep analysis of reports in check.
Determine what's needed on the report and what is need to provide calculations on the report
Officially make available for the clients

Gap from Phase I exists to give Phase I technology room to breath and test the process through its development and then deployment of report side.
Build of repository for new sensor and get in data collection box
Determine sensing priorities
Begin Test flights and collections
Development of new and modification to old when new sensors impact reportable information
Time to update documentation and reach client base with new reporting capabilities
As they relate to

Data Views/Reports II
PHASE IV: Technology/Report Expansion

Sept 2014 Jan 2015

industry needs
 Develop plan and
 continue getting
 deployed to industry.

TIG's growth and expansion

Nov 2011 Jan 2015

Implementation of all
 operational needs to
 successfully deploy
 the technology and
 service.

BUDGET

Project Associated Expense	NDIC's Share	Applicant's Share (Cash/Private Investment)	Total
Technology/UAS Implementation	\$325,000	\$325,000	\$650,000
Data Mining/Alerts/Reporting	\$325,000	\$325,000	\$650,000
TIG Research/Expansion	\$325,000	\$325,000	\$650,000
Technology/Report Expansion		\$325,000	\$325,000
Total	\$975,000	\$1,300,000	\$2,275,000

PHASE I: Technology/UAS Implementation

	Costs	Cost Share	
		NDIC	TIG
Tetracam MCA 6 Channel	15,000	7,500	7,500
HD Block Camera	1,500	750	750
Flight Ready PC	2,500	1,250	1,250
Fasteners/Components/Wires	3,000	1,500	1,500
Technology/Research/Innovation	353,000	176,500	176,500
Sensor Testing	125,000	62,500	62,500
Report and Regulatory Analysis	150,000	75,000	75,000
Total Phase I	650,000	325,000	325,000

PHASE II: Data Mining/Alerts/Reporting

	Costs	Cost Share	
		NDIC	TIG
Beta Server Setup and Annual Cost	4,800	2,400	2,400
Production Server Setup	5,120	2,560	2,560
Application Architecture and General Build	147,200	73,600	73,600
Implementation of Four Sensors	256,000	128,000	128,000
Data Views/Reports	96,000	48,000	48,000
Training and Support	25,600	12,800	12,800
Report design, spec Rqs	50,000	25,000	25,000
Publish Reports	65,280	32,640	32,640

Total Phase II	650,000	325,000	325,000
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PHASE III: TIG Research/Expansion

	Costs	Cost Share	
		NDIC	TIG
Sensor Technology	21,720	10,860	10,860
Research/Innovation	149,000	74,500	74,500
Analyze sensor priority	100,000	50,000	50,000
Implementation of Phased Sensors	156,000	78,000	78,000
Data Views/Reports	96,000	48,000	48,000
Training and Support	12,000	6,000	6,000
Sensor Analysis Changes	51,280	25,640	25,640
Data Views/Reports II	64,000	32,000	32,000
Total Phase III	650,000	325,000	325,000

PHASE IV: Technology/Report Expansion

	Costs	Cost Share	
		NDIC	TIG
Technology/Report Expansion	325,000	0	325,000
Total Phase IV	325,000	0	325,000

APPLICATION CHECKLIST

Use this checklist as a tool to ensure that you have all of the components of the application package. Please note, this checklist is for your use only and does not need to be included in the package.

<input type="checkbox"/>	Application
<input type="checkbox"/>	Transmittal Letter
<input type="checkbox"/>	\$100 Application Contribution
<input type="checkbox"/>	Tax Liability Statement
<input type="checkbox"/>	Letters of Support (If Applicable)
<input type="checkbox"/>	Other Appendices (If Applicable)

When the package is completed, send an electronic version to Ms. Karlene Fine at kfine@nd.gov, and 2 hard copies by mail to:

Karlene Fine, Executive Director
North Dakota Industrial Commission
State Capitol – 14th Floor
600 East Boulevard Ave Dept 405
Bismarck, ND 58505-0840

For more information on the application process please visit:
<http://www.nd.gov/ndic/ogrp/info/ogrcsubgrant-app.pdf>

Questions can be addressed to Ms. Fine at 701-328-3722 or Brent Brannan at 701-425-1237.