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Api 570 piping inspection checklist

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API 570 does not cover inspection, repair, or alteration procedures for specialty equipment or equipment that has been decommissioned. However, piping systems that are temporarily out of service and may be recommissioned in the future are covered by API 570. API RP 574 supplements API 570 to provide information and best practices that assist practitioners in the "how to" inspect piping and common piping components. Industry Application API 570 applies to piping systems that involve process fluids, hydrocarbons, chemical products, natural gas, high-pressure gasses, and other flammable or toxic fluids. Some piping systems such as fluid services operating below a certain threshold or fluid services involving water are optional in regards to API 570 requirements. Furthermore, fitness-for-service assessments and risk-based inspection are accepted methods under API 570 for evaluating on-stream piping systems and pressure containing components. API 570 Piping Inspector Certification API offers a 570 certification through their individual Certification Program. The purpose of the certification is to identify individuals that possess broad knowledge in maintenance, inspection, repair, and alteration of in-service metallic piping systems. In order to receive the certification, applicants must pass a two-part—one closed-book and one open-book—examination. In order to take the exam, applicants must meet minimum education and experience requirements. All applicants must have at least 1 year of experience supervising or performing inspection activities described in API 570. In order to maintain certification, pressure vessel inspectors must apply for recertification every 3 years. Education and specific experience requirements are as follows: Applicants with no formal education can apply to sit for the exam after acquiring 5 years of relevant industry experience. An applicant with a high school diploma or equivalent can apply after acquiring 3 years of relevant industry experience. Applicants with 2 year degrees or certificates in engineering or technology require 2 years of relevant experience. Those holding a bachelor of science degree or higher must have 1 year of relevant experience. Related Topics Relevant Links API Standards Homepage API 570 Certification Page Purchase Document Topic Tools Share this Topic Contribute to Definition We welcome updates to this Intergrated definition from the Inspectioneering community. Click the link below to submit any recommended changes for Inspectioneering's team of editors to review. Contribute to Definition Page 2 Some things are Immutable At the end of the day, it is still about people and qualities like trust, integrity, empathy, care for our fellow man, treating others with respect and dignity, passion, strong work ethic and attention to detail, which are immutable. Overcoming Pitfalls When Establishing an Effective RBI Program September/October 2021 Inspectioneering Journal In this article, the author shares a couple of examples for RBI practitioners that will hopefully spur you on toward excellence in RBI modeling. Highlights from Inspectioneering's Latest Editorial Board Meeting Highlights from Inspectioneering's bi-annual editorial board meeting as they discussed some of the most important challenges, issues, trends, events, or advancements in inspection/mechanical integrity in 2021 and beyond. Should Auld Acquaintance Be Forgo? This retrospective takes a quick look at two of the most popular topics that were covered in Inspectioneering Journal last year: the accuracy of thickness readings and corrosion under insulation. RBI Pitfalls to Avoid and Helpful Advice September/October 2020 Inspectioneering Journal This article discusses some of the common roles of the RBI team and provides a glimpse of an RBI program gap assessment while offering helpful advice for improvement. Inspectioneering Journal Turns 25 The Journal was launched in 1995 with the core mission of helping the fixed equipment reliability community perform their jobs more effectively by arming them with information to better understand and apply available technologies and methodologies. There's Gold in Those Damage Mechanism Reviews September/October 2019 Inspectioneering Journal A damage mechanism review, or DMR, is a structured process performed by a qualified team to gain a better understanding of unit operations, corrosion loops, materials of construction, and potential damage types and locations. January/February 2019 Inspectioneering Journal Take advantage of every reasonable opportunity to properly organize your databases. As the information moves toward High Fidelity, you can achieve improved effectiveness and efficiency in your reliability and mechanical integrity programs. November/December 2018 Inspectioneering Journal This article shares examples of where RBI work processes either broke down or were non-existent, or where the user did not fully understand the technology or overall RBI logic and the results. Quality Assurance - Inspection Strategy Execution July/August 2018 Inspectioneering Journal Whether you are implementing an inspection strategy based on RBI or traditional methods, work should be completed according to a well-defined plan. What are you doing to assure that work is executed as prescribed and that results are reported and acted on appropriately? January/February 2018 Inspectioneering Journal Most of us that work integrity and reliability understand what we do and how we do it. But how many of us understand WHY we do things? Understanding the motives behind our activities, initiatives and programs can help to galvanize and lay a foundation for long term success. Connecting the Proper Inspection Strategies to Damage Mechanisms November/December 2017 Inspectioneering Journal Thanks to the development of documents such as API RP 571 and API RP 586, as well as the emergence of qualification demonstration testing, we can align NDT techniques and inspection strategies better than ever. This article examines this progression and applies it to some sample NDT methods. Establishing Risk Thresholds or Targets RBI July/August 2017 Inspectioneering Journal Establishing risk targets is an important aspect of any risk-based inspection (RBI) program and is a requirement of API RP 580. Metrics and consistency are important considerations for those using RBI to measure and manage risks as part of their decision-making process. March/April 2017 Inspectioneering Journal Inspectioneering Forder & Chief Editor, Greg Alvarado, recently had the privilege to sit down with Clay Whaley, Director of Mechanical Integrity for Phillips 66 (Downstream), to discuss the world of fixed equipment reliability in the refining and... Whiteboard Discussion: A Fundamental RBI Metric Greg Alvarado discusses the concept of "risk in square feet per year", a powerful metric found in the API RP 581 Risk Based Inspection methodology. Understanding metrics such as this one will allow you to begin trending your risks, identifying best practices, and feel comfortable with the decisions you are making in your facility or corporation. 2017's Leadership "To Do List" - Business Processes and their Importance January/February 2017 Inspectioneering Journal We are headed into an era of unprecedented challenges when it comes to software and work process integration. The stakes are high for those who wish to seize the opportunity, especially early adopters and the early majority. Whiteboard Discussion: Foundational Principles of Risk-Based Inspection Greg Alvarado explains the concept of RBI risk thresholds: "How much confidence do I need to have in what I believe to be the true damage state of the equipment?" RBI, Inspection Effectiveness and Human Factors November/December 2016 Inspectioneering Journal Human factors, inspection effectiveness, and RBI all play an important role in running an effective asset management program. This article discusses how each is applicable to inspecting equipment in processing facilities. The Importance of People, Processes & Risk Based Inspection September/October 2016 Inspectioneering Journal Risk-based inspection (RBI) programs and processes are front and center, both as a challenge to get it right, and as an integral tool and process to help us achieve success in risk management and equipment reliability. It has to be implemented, maintained, sustained, and in a state of continuous improvement. Here are some thoughts on how to achieve the inspired results. Why RBI? 6 Reasons to Start Your RBI Program today Anyone who knows that Risk Based Inspection (RBI) and Risk Management are true passions of mine. I have dedicated much of my career to studying them, understanding their intricacies, and witnessing the benefits of their successful implementation. This article briefly discusses the history of RBI and provides a short, yet persuasive justification for investing in establishing an effective RBI program. 2015 is behind us - Let's Look Ahead January/February 2016 Inspectioneering Journal The enormous decline in oil prices over the past 14 months has definitely slowed projects and changed the energy and production landscape. Despite this, refineries, petrochemical plants, and chemical facilities must continue to run safely, responsibly, and reliably. Effective End of Useful Life Strategies for Pressure Equipment July/August 2015 Inspectioneering Journal Asset managers need to know when repairs and replacement are required for many reasons, including safe operation, accurate budgeting, replacement planning, and on-going reliability. When predicting design life based on a simple, linear corrosion rate versus remaining thickness, metallurgical degradation, or crack propagation rates are often not accurate or realistic. Even if the models are good, things change. There is a lot of great technology currently available to us in the private sector, such as personal cell phones and telecommunication devices, including television, automobile features, e-mail, text messaging, data sharing,... 2014 - A Retrospective - Time to Work Even Smarter January/February 2015 Inspectioneering Journal Challenges abounded in 2014 for the process industries, and it does not look like they will let up soon. But then again, that's life, as they say. After 40 years in the industry the old adages still ring true, "there is nothing new under the sun" and "the only constant is change." Design Stage Risk-based Inspection (RBI) - Can it be done? I recently received an inquiry about performing risk-based inspection (RBI) at the design stage of a unit. More specifically, I was asked if it was possible to start an RBI project in the Front End Engineering Design (FEED) phase even though the PFD... Key Performance Indicators - Understanding is Key November/December 2014 Inspectioneering Journal Key Performance Indicators (KPIs) are important for businesses to track measurable progress, or a lack thereof, as compared to pre-defined goals or benchmarks. For those of us in the inspection and equipment reliability world, the same holds true. Often the efficacy of our inspection programs is measured against such goals. Situation Awareness: Making Mobile Technology Work for You Now that the stage has been set (via parts 1 and 2 of this series), let's see what we can do to improve the efficiencies and effectiveness of the work execution processes through situation awareness. Who knows? Maybe even cut a few days off the turnaround in the process. Situation Awareness and Crude Unit Turnaround Work Execution This blog post is the second in a series about situation awareness (SA). The first part of this series introduced SA (defined as the gathering and utilization of data in real time and using it to improve work processes) and introduced an example of how real-time SA can be applied to plant turnarounds to better achieve your turnaround objectives. What Is Situation Awareness (SA) and How Can It Improve My Job? After spending decades in plants and assisting operators in developing mechanical integrity programs, something has become very apparent to me; owner-operators face serious challenges with situation awareness (SA). What do I mean by SA? Active Emission Monitoring for HIC-Affected Vessels AE monitoring has been done for HIC affected vessels, with limited success. The limitation, which greatly affects the confidence level of results, is that traditional AE testing stresses, i.e. Kaiser affect overpressure and felicity effect types of re-stressing do not generate the types of stress necessary to generate elastic strain waves at the HIC laminar crack tips. The Importance of Generic Failure Frequencies in RBI Technology A paper was presented at the 68th Conference of the Italian Thermal Machines Engineering Association entitled Updated Failure Rates and Risk Management in the Process Industries. It was presented in October 2013 by INAIL, an Italian insurance association. The presentation included a thorough analysis of generic failure frequencies used in various American, European, and other sources dating back to 1970. A question was posed to me regarding guidelines for routine external inspection of spheres, including procedural approaches along with any nondestructive examination (NDE). Here are two approaches to inspection of spheres, and a mixture of the two, as a third. Tips on Establishing an Inspection Strategy for a Fertilizer Plant In many ways, fertilizer plants are no different than most process industry plants including refineries and petrochemical facilities. Information in documents like API 510, 570, 653 and RP 580, 581, 571, 577, 579, etc. is essential. 2013 was a year of introspection and progress for the process industries, largely motivated by recent (within the last 10 years) equipment failures and their consequences, some highly publicized. Industry Remembers the Life and Contributions of Trevor Kletz November/December 2013 Inspectioneering Journal API 571, 577, and 580 are now individual, standalone certifications Discussions to allow the certification of three existing API recommended practices (RPs) without prior certification to API 510, 570, or 653 were held at recent API Spring and Fall Refining and Equipment Standards Meetings. Conclusions on Scalable Accuracy We've been discussing Scalable Accuracy and its use related to Lifecycle Management technologies available to owner/operators. The last few topics have included Risk Based Inspection, Fitness for Service using Accuracy, the approach for Equipment Lifecycle Management and, to lay the foundation for proper thinking, making the case for Scalable Accuracy. We've been discussing Scalable Accuracy and its use related to Lifecycle Management technologies available to owner/operators. The last few topics have included Fitness for Service using Scalable Accuracy, the approach for Equipment Lifecycle Management and, to lay the foundation for proper thinking, making the case for Scalable Accuracy. In a continuation on the topic, this week's blog will cover Risk-Based Inspection (RBI), Fitness for Service (FFS) using Scalable Accuracy This blog post continues our discussion from the previous posts on scalable accuracy. We started with a post outlining the steps prior to using scalable accuracy. Then we walked through the scalable accuracy approach to Fixed Equipment LCM. While I normally start with RBI when discussing scalable accuracy, it will be easier to use an example of Fitness for Service as our starting point. The Scalable Accuracy Approach to Equipment Lifecycle Management Continuing from last week's blog, I want to go in depth into scalable accuracy for fixed equipment lifecycle management. In this post, I want to outline the scalable accuracy approach to fixed equipment lifecycle management. Making the Case for Scalable Accuracy In the next few blog posts, we will be going in depth on scalable accuracy. This post walks through the thinking needed prior to initiating. Then we will discuss two technologies immediately available to plant operators for fixed equipment life-cycle maintenance: Risk Based Inspection (RBI) and Fitness for Service (FFS). In Follow Up to the Inspectioneering Journal Article on Hydrogen Bake-Outs In the last issue of Inspectioneering Journal, Marc McConnell at PinnacleAIS submitted an article discussing hydrogen bake-outs. This article was extremely popular among our readers, both of the printed copy of the Journal and our online users. In this post, I want to talk a little bit about fatherhood and what that means to me. This is a big departure from our normal content, but yesterday was Father's Day here in the U.S. and 75 other countries around the world, so I appreciate you indulging me. Uncertainty, RBI Risk Thresholds, and Damage Factor Targets This post is the last in a series about Risk Based Inspection (though, of course, this will not be the last time I discuss RBI). The earlier posts were on reasons for RBI, defining risk, and on managing risk, and on managing risk. In this post, I want to talk about uncertainty, risk thresholds, and damage factor targets. Understanding and Managing Risk This is the third of four blogs in a series about Risk Based Inspection (RBI). You can read the previous blogs on a history and reasons for RBI and on starting to define risk. This post deals with the second half of the equation used to define risk... RBI: Defining Risk (COF/POF) This is the second of four blog posts on a Risk Based Inspection, or RBI. A first post a covered a brief history and started the discussion on why you would want to use RBI. The next step is defining risk. A RBI: A short history and justification Anyone who knows me knows that Risk Based Inspection (RBI), and Risk Management, are a passion of mine, so my next few posts will feature these topics. These are not all-inclusive, but Inspectioneering.com has dozens of articles and you can join our LinkedIn Group for more. Understanding Key Performance Indicators (Lest We Forget...) Part 3 This is my third of three posts on Key Performance Indicators (KPIs) based on requests and discussions on the issue. Update on our AIM Benchmarking Survey We are in the middle of our 2013 Asset Integrity Management Benchmarking Survey. The last Facilities Survey was held seven years ago, in 2006. Some aspects of this year's survey have remained the same as before. Understanding Key Performance Indicators (Lest We Forget...) Part 2 This is my second of three posts on Key Performance Indicators (KPIs) based on requests and discussions on the issue. A In a part 1 of this series I provided a brief overview of KPIs and their ability to predict good, poor, and sometimes dangerous performance in our quests to achieve certain objectives and goals. Understanding Key Performance Indicators (Lest We Forget...) Part 1 Requests for key performance indicators (KPIs) related to equipment integrity management programs have appeared on Inspectioneering's LinkedIn group discussion as well as other industry forums. It also came up numerous times at the recent API Inspection Summit. Three of my blog posts this month will touch this subject. This is a question with which I frequently like to start the API RBI 580/581 training course when I am instructing. It is meant to provoke the attendees to really think hard about why they order an inspection or really think about inspection strategies. Integrity Management Programs, KPIs and PSM March/April 2013 Inspectioneering Journal A pattern of requests for key performance indicators (KPIs) related to equipment integrity management (IM) programs has appeared on Inspectioneering's LinkedIn group discussion as well as other industry forums. Furthermore, the topic came up numerous times at the recent API Inspection Summit. Performance is the key. The Value of Mentors in Inspection and Materials Engineering As a chemist and an inspection and materials specialist, I was truly blessed to have so many wonderful mentors early in my career. Some I picked; some were picked for me, intentionally. 2012 In Review - Growing Value, Expanding Content, Leveraging Synergies January/February 2013 Inspectioneering Journal In response to reader feedback, we implemented some important improvements in 2012. As we broaden our scope to include all aspects of Asset Integrity Management, its synergy and leverage become increasingly important. We will sustain this forward movement in 2013 by continuously seeking ways to serve the Inspectioneering community at maximum value, as you will see by the comprehensive Inspectioneering client survey soon to launch. Risk Based Inspection - Setting Risk Targets July/August 2012 Inspectioneering Journal The question of how to set risk targets is a logical one and should be addressed prior to or in the very early stages of RBI implementation. This article will guide readers through the basic elements required to address this question within an organization, as all companies do not have the same risk philosophy and can adapt these elements to fit their own. Integrity Management and the Oil and Gas Shale Plays May/June 2012 Inspectioneering Journal Development of shale requires the utilization of numerous types of fixed equipment. Due to the high cost and risk associated with hydrocarbon production and processing, E&Ps must continue to manage cost-effective and safe fixed equipment programs. Are the fixed equipment integrity management challenges related to shale development different from the current challenges faced in the upstream oil and gas business? Scalable Accuracy: Inspection Planning and RBI January/February 2012 Inspectioneering Journal The various factors of the challenge, e.g. creating effective and then efficient inspection strategies, are at the crux of the decision process. Within each of these factors are questions that must be answered. The answers should be well thought through and provided as part of your risk-based inspection analysis process. More On Scalable Accuracy November/December 2011 Inspectioneering Journal The original article on scalable accuracy which laid the groundwork for the concept was published in the March/April 2011 issue of the Inspectioneering Journal, entitled Scalable Accuracy, Key Roles of Risk Based Inspection and Fitness for Service, Equipment Life-Cycle Management Process. This article is reprinted immediately following this article for ease of reference. September/October 2011 Inspectioneering Journal Leaks or spills over the life of nuclear power plant operation can lead to undesirable consequences. The nuclear industry's Groundwater Protection Initiatives and lessons learned experiences gained from implementing groundwater protection programs have led to the development of another voluntary industry initiative, the Underground Piping and Tank Integrity Initiative, which aims to better understand the conditions of and mitigate leaks from these components. March/April 2011 Inspectioneering Journal Two technologies, immediately available to plant operators for fixed equipment life-cycle management are Risk-Based Inspection (RBI) and Fitness for Service (FFS), two best practices that optimally work together or can stand alone. Both have abilities of scalable accuracy. November/December 2008 Inspectioneering Journal It is important to preserve as accurate an account as possible if we are to learn from the past. I believe it is important to protect ourselves from ourselves from rationalizing the past to justify movement toward "rationalization of abnormalities", as explained by Mr. Don Holmstrom from the US CSB, appearing in paragraph 21 of the copy of the presentation given by the US Chemical Safety Board to the BP Independent Panel, headed by James A. Baker III, former US Secretary of State. This presentation immediately follows this article. Each paragraph is numbered. These paragraphs will serve as references further in this editorial. September/October 2008 Inspectioneering Journal It has been over 3 years since the fatal blast at the BP Texas City Refinery on March 23, 2005, where 15 lives were lost, more than 170 people injured and survivor's lives changed forever. Historical memory can be an odd thing. July/August 2008 Inspectioneering Journal The following is an interview with Scot Haines, (Corrosion Engineering Advisor). The IJ wishes to thank Scot and the Hess Corporation for taking the time to share with the "IJ" community. You Don't Get Something for Nothing - Risk-Based Inspection May/June 2008 Inspectioneering Journal Do we know how to free ourselves from the current level of thinking to rise to a higher level? It will take this for us to overcome many of our current challenges in the arena of equipment reliability. API 2008 Spring Refining Meeting March/April 2008 Inspectioneering Journal Over the years many in the oil and gas and chemical industry have asked, "What happens at API meetings?" With the important regulatory and business initiatives in place and developing it is a good question to answer that question. Risk Based Inspection - The Regulatory Acceptance Process November/December 2007 Inspectioneering Journal Over the past 18 years of serious RBI involvement, it has become clear to me that there are certain hurdles, that when "cleared", have paved the way for jurisdictional acceptance of RBI (and fitness for service, for that matter). This article will cover many of these "steps", not all as they are numerous, that have lead to success in some of the "toughest" jurisdictions in the US and the world. On your marks, get set, here we go... Where Do I Set My Risk Threshold? September/October 2007 Inspectioneering Journal In my travels around the world as one of the primary API RBI 580/581 training course instructors the question always comes up, "What risk threshold or tolerable risk should I be using?" and "If I do not have one, how can I implement RBI?" September/October 2007 Inspectioneering Journal The Inspectioneering Journal Discussion Forum is a great storehouse of knowledge and experience for people involved in fixed equipment reliability. A few samples of discussions follow, to motivate you to participate. In Memory of John Dunlop McMillan: 1945 - 2007 September/October 2007 Inspectioneering Journal As many of us in the equipment reliability business know, John was extremely active in developing and implementing advanced ultrasonic technologies. He was an innovative leader in our industry and had an impressive list of patents. Risk-Based Inspection: Utilizing Metrics, Maximizing the Value May/June 2007 Inspectioneering Journal This is part 2 in a multi-part series. Part 1 set the stage in explaining the basics of RBI. As I am most familiar with API Base Resource Document 581, I will continue to use this technical basis for this article. March/April 2007 Inspectioneering Journal An earlier version of this updated article appeared in the January-February 1998 issue of the Inspectioneering Journal. It is hard to believe that nine years have passed so quickly. Fortunately the industry, as a whole, has learned much and technologies have advanced, in the interim. Unfortunately, in that time period plant infrastructures have aged and equipment has failed, sometimes with catastrophic results. Some failures were directly attributable to damage mechanisms and fixed equipment reliability program weaknesses. Often times related, what appears to be breakdown in management systems, in refineries, chemical plants and exploration and production areas that lead or contributed to or enabled equipment failure 1, 2, 3... On the other hand, organizations like the API (American Petroleum Institute) RBI User Group, API RP 579 Fitness for Service Committee, API Subcommittees on Inspection and Corrosion and Materials continue to move forward, desiring and acting to improve the effectiveness of fixed equipment reliability programs via implementation of sound risk based inspection technology and the creation of excellent supporting reference documents like API RP 571 on damage mechanisms. These committees continue to improve their codes and respective reference documents as do other organizations in various countries, such as NACE, EU CEN documents, the HSE, ABSA (the Alberta Boiler Safety Association), ASME, Australian authorities, the state of California and others too numerous to list. July/August 2006 Inspectioneering Journal The Shell Martinez Refinery has been in operation since 1915, and is located 30 miles northeast of San Francisco on about 1,000 acres of land. The refinery combines state-of-the-art facilities and equipment to convert approximately 165,000 barrels of crude oil a day into many products including automotive gasoline, jet fuel, diesel, petroleum coke, industrial fuel oils, liquefied petroleum gas, asphalt, sulfur, and lubricants. The Shell Martinez Refinery has grown into a sprawling yet efficient assemblage of sophisticated processing equipment; modern control rooms; environmental protection facilities; shipping and receiving terminals for marine, rail, and truck cargoes; maintenance shops; office buildings; quality assurance laboratories; storage tanks; and warehouses. In some ways it resembles a small city with its own utilities, medical facilities, and fire department. IJ 2006 Survey Preliminary Results January/February 2006 Inspectioneering Journal This survey did not make metrics the primary focus. More importantly, our focus was on practices that lead to better performance. You still have to link these practices to performance. The Inspectioneering Journal Marks 10 Year Anniversary March/April 2005 Inspectioneering Journal We are happy to announce the 10-year anniversary of the inaugural issue of the Inspectioneering Journal. Interview with John Nyholt, BP NDE Specialist September/October 2004 Inspectioneering Journal Exactly two years ago, an interview with John Nyholt appeared in the "IJ". New ground will be covered in this interchange. We at the IJ thought it might be valuable to spend some time chatting about his background, challenges he has faced recently and what he feels are some of the biggest challenges ahead for the Inspectioneering community. Staying on Track in a Complex Environment July/August 2004 Inspectioneering Journal The "low hanging fruit" has been harvested in most places. Now comes the challenge of gathering the most bountiful harvest, that which is amongst the leaves and branches, without harming the tree. This will require practical expertise. This will require computational models that narrow the scatter band and are more accurate that are asking the right questions (which requires practical knowledge, technical knowledge and experience = expertise). In this editorial, I will point out some of the pitfalls I see in the inspection and reliability arenas and present some insight and solutions that will help "IJ" readers stay on track and emerge more successful as a result. Considering Buying Linked Inspection Database Management and RBI Programs? March/April 2004 Inspectioneering Journal Data management is an important issue in today's world. We have data all over the place. Every manager is looking for ways to migrate data from platform to platform to save on the cost of re-gathering data and ways to share output from various platforms to better schedule and coordinate activities. RBI - Eliminating Misconceptions and Misapprehensions March/April 2004 Inspectioneering Journal In the early days (circa 1988-1991) of introducing the petroleum refining and chemical industries in the US, to the idea that RBI implementation could be valuable many fell into the trap of focusing on how much money could be saved, to the exclusion of risk mitigation. This led to some unfortunate misconceptions that led to misapplication that led to dead ends in how to evergreen or maintain effective RBI programs. It is important to "get back to basics", with an improved perspective, based on experience, of where the evolution of the RBI process is leading us. July/August 2003 Inspectioneering Journal "Low Hanging Fruit" and "Step Change" are analogies that have been bandied around in our industries for some time. Picking the low hanging fruit is just the beginning and something that most passersby can glean. Also, real change that affects an entire organization, change that lasts, does not happen overnight and usually involves a combination of education, mentoring and recognition, appreciation and understanding of the limitations, resources, potential and culture of/at the various levels of the organization. Low hanging fruit is the easiest to see and pick, but what about the vast amount of fruit that resides amongst the leaves and branches? That is now the challenge of our industries. This is where the greatest harvest lays. Why have change and greater rewards been so difficult to realize? I believe there are many reasons, such as a lack of mentoring, a lack of appreciation and understanding of the limitations, resources, potential and culture of the various levels of the organization. Risk Based Inspection (RBI) Impact of Inspection Procedures - Documentation - The RBI team - RBI technology basis - RBI codes and standards This article will focus on, "the role of inspection histories and inspection planning". Risk Based Inspection Implementation March/April 2003 Inspectioneering Journal The large LNG facility is located on DAS Island, offshore of Abu Dhabi, in the Persian Gulf and experiences extremely high humidity year round. These conditions are known to produce a high potential for external corrosion and under insulation corrosion of carbon steel and mild steel alloys. If chlorides are present, which can drift from seawater, and are sometimes present in insulation, there may be a potential for Chloride Stress Corrosion Cracking (CSCC) of austenitic stainless steels (SS). Canadian Province Issues Minimum Requirements for RBI November/December 2002 Inspectioneering Journal The Alberta Boilers Safety Association (ABSA) issued the requirements document, Risk Based Inspection Programs for Pressure Equipment, in March 2001. This document defines the minimum requirements for the development and use of risk based inspection (RBI) to manage the safety of pressure containing equipment in Alberta. Interview with John Nyholt, BP NDE Specialist September/October 2002 Inspectioneering Journal The Growing Importance of Understanding NDE Applications and Results November/December 2001 Inspectioneering Journal A typical risk based inspection (RBI) analysis should include past inspection results, tempered by confidence in those results. For example, API's (American Petroleum Institute) RBI methodology and software when calculating the likelihood of failure side of the risk equation asks for past inspection histories. This includes dates of past inspections for potential damage mechanisms, the effectiveness of those inspection techniques to find the anticipated damage and amounts of coverage. Via this logic, the program constructs a factor to represent the probable damage population scatter band and multiplies this times the entered corrosion rates, cracking susceptibilities or bulk damage rates. September/October 2001 Inspectioneering Journal In part 1 we covered: - Evolution of the emergence of advanced NDE - External and internal motivators to develop more effective inspection programs - Risk based approaches - Sources of industry reference materials - Setting the Course - Why Inspect - Metrics for inspection program progress - Role of Risk Based Inspection I will now cover some of the remaining key aspects in assuring healthy evolution of the equipment integrity process. July/August 2001 Inspectioneering Journal We've come a long way since my introduction to plant inspection processes in 1975 and certainly since the industrial revolution in the late 1800's. As I recall from history class it was the intent of the wealthy industrialist to make money, plain and simple. Safety and environmental responsibility were not the primary concerns, in some cases not concerns at all! Hence, for safety's sake, terms like "sweatshops" were coined. This was to connote factories and textile mills where human beings, often times young children worked, in poor conditions. Interview with Dr. David Wang - Primary NDE Researcher July/August 2001 Inspectioneering Journal Inspectioneering caught up with Dave Wang at the American Petroleum Institute's (API) Spring 2001 Refining meeting in Atlanta, Georgia. We spent some time, near the pool at a break between meetings, discussing Dave's background, experiences and the future of NDE from his perspective. Profile on AGIP Refinery Inspection Department Livorno, Italy November/December 2000 Inspectioneering Journal Firstly, I want to thank the inspection/materials engineering/corrosion department manager, Giovanni Graziani, for agreeing to my visit and for sharing experiences with the Inspectioneering Journal community. The hospitality of Giovanni, two of his senior area inspectors, Alessandro Grassi and Sauro Benini and Edy Sgherri their IT forgotten, nor the excellent food and espresso in the cafeteria. September/October 2000 Inspectioneering Journal In part 1 of this series the importance of keeping the RBI process as simple as possible was stressed. Software, consequence and likelihood issues were covered. Consequences were handled directly while likelihood issues were covered in discussion on damage modules and qualitative versus quantitative sections. July/August 2000 Inspectioneering Journal Hundreds of risk based inspection analyses have been completed by contractors and owner users worldwide, by now. Much is being learned as the various approaches gain acceptance. This editorial is only one perspective built upon the experiences of many. Risk Based Inspection (RBI) November/December 1999 Inspectioneering Journal Here are some of my observations based on numerous discussions with owner users and involvement in over 30 projects. This learning is from plant operators who have taken the RBI "plunge", after they have had time to think about their decisions and direction, using various software products. Some owner user answers are included and will be identified as such. In addition to the questions in part 1, I included a listing of some generic families of RBI tools or approaches. Risk Based Inspection (RBI) - The Current State September/October 1999 Inspectioneering Journal There are many analysis tools available in the market that lay hold of the "RBI" claim. I wanted to bring you, the reader, "up to speed" on some of the available technology based on my experience as an RBI project manager, client manager and member of the American Petroleum Institute committee and working group compiling the RBI Recommended Practice 580, Food for Thought - Risk Based Inspection (RBI) September/October 1998 Inspectioneering Journal I have observed through literally hundreds of discussions and reading numerous articles on risk-based approaches that at least one potential business pitfall is appearing when owner-operators choose to begin with a "Level 1" (very qualitative) approach. They may not have the confidence to take advantage of re-allocating resources from the "low" risk equipment to the "higher" risk equipment. Risk Based Inspection and Regulatory Compliance - Can Co-Exist September/October 1998 Inspectioneering Journal Inspectioneering Journal to determine mechanical integrity is important to verify that equipment is suitable for intended use, i.e. to prevent or minimize the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals as required by OSHA 1910.119 - Process Safety Management of Highly Hazardous Chemicals (and other jurisdictional codes). May/June 1998 Inspectioneering Journal The Environmental Protection Agency (EPA) issued the report on this catastrophic failure that involved two storage tanks in a Pennsylvania refinery. The report issued March 20, 1998, stated that while both tanks had roof replacements since their initial construction, no further information was available about routine inspection or maintenance procedures. Risk Based Inspection - Understandings and Expectations January/February 1998 Inspectioneering Journal There is a potential for misconceptions about terms used regarding risk by non-risk management professionals. Understand that some risk is unavoidable. We can attempt to minimize risk to any extent desired, but without an effective process that addresses all the parameters we consider important it is more likely our level of effectiveness will suffer. There is more to these considerations than the likelihood of failure, which most inspection, materials and corrosion specialists understand. Risk Based Inspection (RBI) - What's Best for You? September/October 1997 Inspectioneering Journal The amount of serious questions regarding the various technology options for implementing an effective RBI program is growing by leaps and bounds. I, for one, have seen many forms of what various organizations refer to as RBI. Remember that there are to the Risk equation, i.e. likelihood or probability of failure and consequence of failure. The effectiveness of the RBI tool is highly dependent upon algorithm design, especially parametric considerations and their relative effect on one another and your objectives. What's the Connection between RCM and RBI? March/April 1997 Inspectioneering Journal Our business paradigm is going through tremendous changes, as most of our readers can attest to. Look at the mega-mergers looming and happening in the petroleum business along with the tight margins most of them operate on. September/October 1996 Inspectioneering Journal "Inspection and testing procedures shall follow recognized and generally accepted good engineering practice," can mean many things to many people. Fortunately, organizations like API, NACE, ASME, etc. have taken the initiative in establishing many of these practices for decades. Tips for Successful Contracting of NDE Services March/April 1996 Inspectioneering Journal We all have a responsibility to perform the best job we can for our employers/customers. That is why I am sharing my thoughts with you, my clients, the Inspectioneering Journal readers. In 12 years of being on the owner/user side of the fence, as a chief chemist for NI (National Lead) Industries and a senior member of the materials engineering and corrosion staff for Monsanto Chemical Company, combined with another 9 years in the role of marketing, consulting and sales of NDE and engineering services to the process sectors, I have seen where we often become our own worst enemy. Yes, I mean either as the service provider or the client. November/December 1995 Inspectioneering Journal Nelson Curve changes in the late 1980's provided cause for Shell Oil Company to look at more reliable NDE non-destructive evaluation methods for assessment of materials/equipment in high temperature hydrogen service. The primary change motivating Shell was the lowering of the C-0.5 Mo steel Nelson Curve to the carbon steel level. Inspection of Glass-Lined Equipment - A Refresher September/October 1995 Inspectioneering Journal If it's glass-lined, chances are the environment is very corrosive to most metals. In general, once the glass lining is breached, through-wall corrosion doesn't take very long. An effective maintenance, operation and inspection program can go a long way in minimizing this possibility. July/August 1995 Inspectioneering Journal With miles of piping and tons of equipment to consider for on-stream inspection or monitoring you probably have: Back to Basics: Key to establishment of an effective inspection program May/June 1995 Inspectioneering Journal Never have I known or read of anyone, who sought out wisdom, to regret it, nor to help but benefit from it. Wouldn't you agree, wisdom recognizes, holds onto, operates out of and values times, tried and true principles that can be, and should be applied to any and every area of our lives? Begin With the End in Mind March/April 1995 Inspectioneering Journal Most inspection companies, including those who dabble in engineering, today, go about things in much the same way as they have in the last five to ten years. Some offer routine services at bargain-basement prices. Others provide high tech services... Welcome to the First Issue of the Inspectioneering Journal March/April 1995 Inspectioneering Journal We dedicate this forum to the owners/operators of Chemical, Refining and Utility process facilities. The Inspectioneering Journal will publish articles on a bi-monthly basis. Some of the topics we will cover as they relate to mechanical integrity...

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