

Journal

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*EMERGENCY RESPONSE
& CRISIS PREVENTION*



Health Sciences
Pharma Biotech
Consulting

Formerly NSF-DBA

www.nsf.org

welcome

NSF Health Sciences: Emergency Response & Crisis Prevention

In this volatile world every company has its ups and downs. The downs come in many shapes and sizes. From downsizing through to full-blown remediation after a tough inspection; one that threatens your very future. In emergency medicine, medics talk about the **Critical Hour** in patient care. We talk about the same when a company receives a warning letter, import ban, consent decree or similar. What you do and what you say in the first hour defines your future. If you want to survive and thrive just follow our Three Cs on pages 3-7. Our approach to remediation is innovative, focused and allows you to build a platform for “perpetual GMP inspection readiness.” By following our Three Cs you will emerge from remediation stronger as a team, smarter and more competitive as a business.

Medics also tell us that prevention is better than the cure. We believe that spending \$10,000 preventing a problem is smarter than spending \$100,000 on painful quick fixes. This means being prepared for predictable events, regulatory changes and other threats to the business. Pete Gough’s update on page 15 will give you the latest regulatory weather forecast as to what is coming your way. Our article on organizational resilience will also help you prepare for even bigger challenges, especially the “not if, but when” type. Please complete our questionnaire on page 12 and take a first step in protecting your business.

At NSF our focus is to prepare our clients for the future, not for the past. What worked last week may no longer be fit for purpose. Many clients regard us as their local emergency service, providing emergency response as well as crisis prevention. When the going gets tough, remember the importance of the Critical Hour and give us a call before you do anything.

Finally, remember “Olivier and Singers” assumptions on managing business performance:

- > All issues will have a root cause(s)
- > All issues are preventable
- > Prevention costs less than correction

Time and again, engaging with us provides a return on investment that keeps you and your stakeholders facing the future with confidence.

Enjoy the read and keep in touch.



Martin Lush



Martin Lush
President, NSF Health
Sciences Pharma
Biotech Consulting

The A to Z of Quality Systems Remediation

(from Adversity to Zymosis)

A company facing a laundry list of observations at the end of any regulatory inspection will likely react with great energy and purpose to fix each one.

This reactionary approach will likely lead to disappointment upon the next regulatory inspection when the inspection reveals additional examples of the same or similar problems. It can rapidly become a repetitive cycle of failures resulting in chronic quality system/GMP non-compliance. This happens when the company focuses on the symptoms rather than the underlying causes. If the underlying systems are not corrected, inspection after inspection will identify examples of the same system weaknesses.

Strategic well planned remediation is paramount to long-term sustainable corrections and corrective actions. The

value of a systems approach to corrective actions is recognized globally, with MHRA and FDA recommending a quality systems approach. Correcting specific findings without correcting the underlying causative system is analogous to treating symptoms rather than curing the disease. A systems approach is not a controversial concept and many who are caught up in the “findings/company fix/findings/company fix...” cycle from one inspection to the next believe they are taking a systematic approach. In reality, they focus on fixing specifics or elements of underlying systems without regard to the causes of the problem. This superficial approach assures failure.



by Maxine Fritz,
Executive Vice
President, NSF
Health Sciences
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A former US FDA investigator and industry expert with over 25 years of pharma, biologics, and biotech quality systems, compliance, and regulatory experience specializing in strategic pragmatic solutions to customer needs.



Continued **The A to Z of Quality Systems Remediation**

A robust quality system, first and foremost, provides assurance of high quality products. An additional benefit is assurance of regulatory compliance. A company that prides itself in having a comprehensive, sustainable quality system distinguishes itself from one whose objective is to be in compliance. The latter fails to capitalize on the business advantages of a quality system. Creating a compliant quality system can be achieved by addressing the subsystems of the quality systems.

Key to Success Factors – Company Culture, Communication and Collaboration

Over years of performing a variety of large- to small-scale remediation projects, we have found three key success factors that will almost always assure that the outcome will be positive, successful and sustainable. The three key indicators are known as the **“Cs to success” or company culture, communication and collaboration**. These three key indicators are not always easy to implement and must be factored in early on and as part of the remediation plan. Like a three-legged stool that will not stand properly if it loses one of its legs, all three Cs are equally important to the success of the remediation and without all three, the likelihood of success is marginal.

A remediation plan that applies a systems-based team approach with collaboration and communication can itself have a positive effect on culture, but a concerted effort must be made by management to assure alignment of values with the remediation activities. This can be very difficult.

Company Culture

At the heart of any successful remediation should be the requirement to align a company's organization to a common vision to establish a robust remediation that meets regulatory requirements and supports the company's business strategy. The values

reflected in the company's organization and support systems impact behaviors that ultimately influence the manner in which the remediation activities are executed. For example, see the case study, Remediation Done Right, on page 6.

However, if organizational values are not in sync with the vision and the remediation plan and principles, the remedial solutions – such as establishing, revising and modifying procedures or processes – may change, but the behaviors of personnel may not, resulting in a compliant system on paper but not in actual practice. For example, see the case study, Remediation Done Wrong, on page 7. In this situation, any remediation/system corrections will likely not be sustainable. In addition, how employees are incentivized, rewarded, compensated, promoted, etc. influences behaviors. Sometimes little attention is given to the behavioral impacts and how they can impact the remediation efforts. Management must lead by example and when in conflict with its words, this will send clear messages to the organization that



certain behaviors are tolerated, expected and/or permitted. During any remediation this will result in an organization at odds and in conflict.

Before remediation activities commence, personnel must understand the significance of the issues with respect to the regulation. They must first learn about basic regulatory terminology, requirements and expectations. Education and training should be comprehensive on regulations, requirements and approaches for personnel. Training should include an introduction to pharmaceutical law, management responsibility, basic pharmaceutical GMP/ quality systems requirements and the fundamentals of building a quality system. The structure of the training should highlight regulatory expectations and current industry best practices, and address domestic and international regulatory requirements. The program should be structured to assure that employees absorb the material and incorporate it into their responsibilities.

Communication

Communications must be planned, measured, consistent and managed to assure clarity, effective conveyance of key ideas and consistent support of ongoing development. Providing the necessary attention to organizational culture can speed the process of remediation and assure its ultimate success.

To implement sustainable organizational improvements, communication is required so that members of the organization have a common understanding of why change is required of them and the organization. Initial and ongoing communication should detail the remediation plan and strategy and what is expected from personnel both directly and peripherally impacted. To help communicate the plan, a charter and remediation playbook should be developed. The purpose of the charter is to define roles and responsibilities, team structure and scope of work. The remediation playbook establishes a common understanding among the team players involved in the remediation and standardizes the approach of how to conduct the work required in the remediation. The playbook also provides the general parameters and structure for the remediation including:

- > Core project team structure and the membership
- > Structure of the kick-off meeting to provide an overview of the core team process and all the phases of the project, including:
 - ◆ Overall project goals, scope and critical success criteria
 - ◆ Key project, phases, deliverables and milestones
 - ◆ Project team organization and governance structure

A steering committee (also called the leadership or management team) oversees the entire project. It consists of the most senior managers representing the various functional

Continued **The A to Z of Quality Systems Remediation**

areas of the company along with a third-party senior management expert for objective regulatory assistance. This team sets the vision, provides the necessary resources and commitment, assures linkages between the various teams, serves as the change agent for cultural and system issues, and resolves issues that invariably surface during the

course of the project. It also affords visibility of senior management's quality commitment.

Collaboration

Collaboration is essential for any organizational change and for building the relationship with team members, and the client is paramount to a successful remediation

Remediation Done Right

– An Optimal Mixture of the Three Cs

Company A is a large multinational company with over 50 locations, various product lines and a strong drive for continuous improvement. The company proactively reached out to NSF for help with a number of quality system-related issues. More remarkably, the company was not under any kind of regulatory action and was in good standing with regulators. Instead, executive management recognized a quality system that was overly complex, had systemic issues and was not in line with industry best practices.

Senior management's drive to initiate this remediation effort was indicative of the company's culture, one of continuous improvement driven internally and not through an external regulatory action.

The remediation effort started under ideal circumstances with strong sponsorship from executive management and effective communication throughout the organization of the ultimate goal of the project. A project steering committee was formed to ensure that the project remained a top priority for the organization and to demonstrate executive ownership of the project.

Project teams were established consisting of NSF subject matter experts and cross-functional client team members. This composition helped create a team mindset that the project was a collaborative effort with both the client and NSF working together to provide the optimal solution. This spirit of collaboration ensures that a solution is achieved that not only reflects industry best practices but is also an ideal fit for the client and ensures sustainability since the client is part of the solution.

As part of the project governance, weekly meetings were held at the project team and project oversight levels. Meetings were well attended and issues were promptly escalated for resolution. The project was an overall success resulting in a less complex quality system that incorporated industry best practices throughout the system.

For more information on NSF Pharma Biotech Cor
Maxine Fritz at mfritz@nsf.org or call **+1 202-828-1**

outcome. Establishing a quality system that meets a company's regulatory and business needs is challenging enough and in most instances requires third-party experts to help companies address the quality systems issues. The quality system can take months if not years to remediate and a company can achieve success if it recognizes the value of a collaborative systems approach. It will ultimately impact the organizational culture and allow a group of people to constructively explore ideas for effective, efficient and

compliant solutions. A company that does not embrace collaboration puts the organization at a disadvantage and risk. The more a team collaborates toward a common goal, the better the working relationship, resulting in open sharing, discussion and agreement of solutions.

A Tale of Two Remediation Projects

These two case studies illustrate the points in this article.

Remediation Done Wrong

– A Systemic Breakdown of the Three Cs

Similar to Company A, Company B is a large company with many locations worldwide and a number of product lines. However, that is where the similarities end. Company B engaged a number of consulting firms after facing significant regulatory action. The engagement was a knee-jerk reaction to a regulatory action and was not well orchestrated.

Communication with the senior management was strained as a multitude of events were competing for senior management's time. A project steering committee was not formed due to client time restraints and executive sponsorship was spread thin throughout the organization. This resulted in the remediation effort being one of many competing priorities which did not get the full support of the organization. The culture of the organization was not one of continuous improvement but one of fear and an overriding theme was "what do we need to do to get out of trouble."

Without executive sponsorship and open lines of communication, the project suffered and timelines were extended, resulting in more knee-jerk reactions to get a quick fix in place. Weekly meetings were set up but poorly attended by both senior leadership and client project team members. Senior leadership did not make the remediation effort a priority and sites followed their lead.

Collaboration was limited and the client was content to have the consulting firms fix the issues independent of active client participation. The result is a solution that is done to the client as opposed to the client being part of the solution. The sustainability of these efforts is dubious as the client is not intimately familiar with the new system and processes that it must now operate within.



consulting remediation services, please contact
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You may be aware of our European on-site modular training programs modeled on the Qualified Persons training, but did you know we offer similar education and training options to our US customers?

We can provide targeted or broad-based courses. Targeted programs address current industry hot topics or key training topics such as investigations or pharma GMP law. Broad-based programs are uniquely designed to significantly impact the company and employees, with moderate or high client customization.

- > An example of a moderately customized program is the Quality Certification Program we have offered companies in the US since 2004. This modular program has been built following the framework of the EU Qualified Person modules and customized for each client based on its unique product mix and priorities. We can combine modules, embed specific content to address new technologies or highlight important programs the company is launching.
- > An example of a highly customized program is one designed to address a specific client request, typically aimed at conveying greater GMP awareness and product/process knowledge to all levels of the company. Depending on the size of the company, these programs can touch hundreds to thousands of colleagues across the organization.

Both types of program are designed to significantly increase knowledge, GMP and risk awareness and ultimately impact the company's quality culture. Everyone goes through the same program, experiences the same content and listens to the same message. There is no better way to gain organizational alignment than through a

shared experience that colleagues talk about years later!

Benefits of On-Site Training

Customization – NSF trainers come to your location, saving you travel expenses and time away from the workplace.

Flexible scheduling – We adjust to your schedule as needed.

Training that fits – We offer established courses, customized programs or development of a new offering.

Expert training – Our trainers have years of industry experience and understand what is important.

We have developed the following on-site programs to address specific topic areas:

Data Integrity

This two-day course aims to reduce the risk of data integrity concerns through greater understanding of data integrity - what it is, where it is an issue and what can be done to recognize and mitigate its risk. You'll learn how to ensure the company quality management system addresses data integrity risk through surveillance and proactive measures.

Give us a call if you have an interest in any of the education and training curriculum. Contact **Austi**

Education and Training

Advanced Investigative Techniques

This two- to four-day course covers reactive and proactive approaches to human error reduction based on a fundamental understanding of the science of human error. The course program can be adapted to cover investigative techniques and root cause analysis depending on your company's needs. The goal of the course is to eliminate reoccurring deviations attributed to human error and ensure personnel have the knowledge and ability to realize "right-first-time" operations.



Cost of Poor Quality (CoPQ)

This two-day course provides a comprehensive review of the costs associated with quality management and how to identify and quantify these costs. Often, slow-moving inventory, rework and failure costs are not well understood in companies. Prevention costs are undervalued and not tracked methodically. This program is designed to help managers and senior leaders understand the strategic and operational requirements to implement a successful CoPQ process across the supply chain.

Pharmaceutical GMP Audits and Self-Inspections

(An IRCA Certified PQMS Auditor/Lead Auditor Course)



A17638

This course is for pharmaceutical professionals moving into an auditing role or currently conducting GMP audits of suppliers, contract manufacturers and internal audits. Accredited by IRCA, this course is based on auditing the pharmaceutical quality system. Successful completion can lead to IRCA certification, dependent upon audit experience.

Pharmaceutical GMP Law

This three-day course provides a solid understanding of GMP/regulatory requirements in the US, Europe and other regions including China, India and Brazil. It covers the role of ICH, pharmacopoeias and PIC/S and provides an overview of the latest regulatory developments in the GMP area. This highly interactive course provides the foundational knowledge needed by personnel in decision making roles in quality, regulatory, manufacturing and other technical disciplines. The course can be tailored to a shorter duration.



by Jim Morris,
Executive
Director, NSF
Health Sciences
Pharma Biotech
Consulting

Jim has over 25 years' pharmaceutical management experience in plant. His areas of expertise include quality leadership training, human error training, sterile manufacturing, quality management systems and auditing programs.

se topics or are considering a broad-based
n Caudle at acaudle@nsf.org or +1 202-822-1850

CAN YOU TAKE THE HITS AND

How to thrive when the going gets tough – Your ORG

by Martin Lush

At NSF we're really passionate about two things.

- > We do our best to our best to ensure our clients continue to supply patients with the products they need.
- > We help you to prepare for the future, not for a world that no longer exists.

We specialize in helping you become resilient so you can prepare for disruptions, recover from shocks and stresses, and bounce back, revitalized from unplanned disruptive events.

*We all live in an uncertain world. To protect your licences, your market share and profitability, you **must build in ORGANIZATIONAL RESILIENCE**. That is the ability to bounce back quickly and stronger following a surprise event.*

The **KEY** Question:

Will your people, processes, systems and procedures bounce back no matter what hits them?

ORGANIZATIONAL RESILIENCE SELF-ASSESSMENT: YOUR TASK (15 minutes total)

Step One: Awareness (5 minutes)

Accepting reality and being aware of the challenges on the horizon is vital. Once acknowledged you can put plans in place for dealing with them. Look at the “predictable surprises” listed under Step One: Awareness below. These events are going to happen and you need to be ready and waiting.

- > Discuss these challenges with your colleagues.
- > Which one do you think you are most vulnerable to?
- > Would you add others, unique to your situation, location or circumstances?

Step Two: Self-Assessment (10 minutes)

To succeed in a turbulent, unpredictable world you must know your strengths, vulnerabilities and the associated risks you face.

- > Take this questionnaire along to your next team meeting or shift handover.
- > Discuss each best practice carefully and give yourself a score where 5 means you're doing everything described and 1 means the opposite! To keep it simple, we've focused on the top five to six points for each, the “must haves.”
- > Be honest. Explore areas of disagreement; don't defend them.

Step Three: Reflection and Action Planning (5 minutes)

- > What are your top three vulnerabilities?
- > What actions must you take to become more resilient?
- > Please don't reinvent the wheel. If you would like a free copy of best industry practices for each area, please let me know (martinlush@nsf.org). We will give you practical guidance on how to improve your organizational resilience in each of the areas covered.

STEP ONE: AWARENESS

Task:

Consider the following predictable surprises. These are just a sample of the key challenges that you will face. It's not a question of if, but when. Each will have a profound ripple effect on every company, big or small. Discuss each one. Are there challenges unique to your location, market, products and processes that you could add?

Environmental, political and socioeconomic instability:

The world is a turbulent place. Any one of these alone would be challenging. The fact

BOUNCE BACK STRONGER?

ORGANIZATIONAL RESILIENCE HEALTH CHECK

that all three are happening at the same time means that the pharma world will continue to change radically. Every aspect of the product lifecycle from research to distribution will face new challenges. New threats will surface requiring different decisions. Disruption to your complex supply chain is inevitable. How will you bounce back?

Scarcity of an educated workforce and the talent war

The growth in the global labor force will fall by nearly one-third by 2030. By 2020 it is predicted that business will be short of 85 million workers with college degrees or vocational training. The shortage of scientists, engineers, biologists, pharmacists and the like will become acute. Companies must attract and retain the best people – those capable of making the right decisions across your organization. Are you ready?

Lower prices and lower profit margins

With the population aging and an obesity pandemic to deal with, governments will be forced to restructure healthcare and health insurance systems. Medicines will be seen as commodity items. The pressure to reduce price will be acute. How will you cope?

New low-cost centers of manufacture

As India and China become more expensive, the manufacture of low-tech medicines will move; further driving down prices and profit margins. How will you react?

More regulations to absorb and implement... only with fewer resources

Enough said! Do you know what's coming? Do you have plans in place?

Shortage of raw materials, including water

With everyone chasing the same limited resources, shortages (and increased cost) are inevitable. Many regions of the world

are suffering from chronic drought. Since the pharma industry uses a lot of water, the impact will be profound. California (a center for biologics manufacture) as well as manufacturing hubs in southern Europe, India and China are all suffering from the longest droughts in living memory. The flip side of this is too much of the wet stuff. Plants built on low-lying flood plains will be challenged by keeping water out. Are you ready? How will you adapt?

SO, IN SUMMARY

- > You will be asked to do more with less
- > You will have to simplify systems, dismantle bureaucracies, remove hierarchies and speed up decision making
- > You will have to fight hard to attract and retain the best people
- > You must invest in education and excel at doing the basics exceptionally well (such as risk-based decision making, intelligent risk and change management and problem solving)
- > You will face disruption to your supply chains
- > You will have to dramatically improve efficiencies without compromising product safety, quality and efficacy

What other challenges do you foresee?

STEP TWO: SELF-ASSESSMENT

Despite these predictable surprises, we're very optimistic about the future, as are many of the clients we've helped to get back to basics. They are now prepared and resilient. If you're complacent, you won't be. The key question is how do you compare with your resilient competitors?

Task:

Discuss the following openly with colleagues and give yourself a score of 1 to 5 (where 5 is the best possible score).

CAN YOU TAKE THE HITS AND BOUNCE BACK STRONGER?

Continued How to thrive when the going gets tough – Your **ORGANIZATIONAL RESILIENCE HEALTH CHECK**



Do you have a resilient quality culture?

SCORE

- > Very high levels of trust/respect across all sites, departments and business units?
- > Total transparency. Good and bad news is shared, not restricted or manipulated?
- > Very high levels of collaboration throughout. Silos non-existent?
- > Passionate about people (education and development) and patients?
- > QA totally integrated and on the shop floor?
- > Focus on prevention and improvement, not firefighting and crisis management?

Do you have resilient leadership at every level?

- > Everyone has in-depth knowledge of products and processes?
- > Supervisors (first line managers) spend at least 80 percent of time on the shop floor?
- > Blame free culture from top to bottom, at all times?
- > Leadership understands the product lifecycle from start to finish?
- > Leadership possesses excellent risk-based decision making skills?
- > Leadership ALWAYS keeps the patient and their people at the heart of everything they do?

Do you have resilient people?

- > Low levels of staff turnover (less than 5 percent)?
- > Low levels of contract workers (less than 5 percent)?
- > Key activities/functions (QPs, HR, engineering, validation, etc.) not contracted out?
- > Training seen as a profit generator, not a cost center?
- > Cross-functional development of people at every level?
- > Training takes the 10/20/70 approach. If you don't understand this question, give yourself a 1!

Do you have resilient manufacturing processes?

- > Reliable and robust with very low levels of reprocessing, rework and work in progress?
- > Quality by design and continuous process verification to ensure consistency?
- > Plant/equipment utilization in excess of 80 percent?
- > Stock levels (materials, components, etc.) that provide some redundancy/cover?

Do you have resilient management of third parties?

- > Third parties selected based on quality and professionalism, not price alone?
- > Treated as partners, not contractors (genuine win:win)?
- > Clear technical agreements in place describing the who, what, why and how?
- > Level of your management support and oversight based on risk?
- > Information shared via knowledge management system (KMS)?

Do you have resilient management deviations?

- > All incidents reported within 60 minutes?
- > Every incident risk-ranked, using risk-based impact assessment criteria within 4 hours?

- > Investigations investigated proportionate to risk?
- > Investigations take place where the incident happened, not from behind a desk?
- > Do you have less than 5 percent of repeat incidents per year?
- > CAPAs focus on prevention. Ratio of two preventive to every one corrective action?
- > Human error considered as the starting point of investigation, rarely its conclusion?
- > Information shared via knowledge management system (KMS)?

Do you have resilient management of change?

- > Change requests approved in less than 60 minutes?
- > Change control system rejects at least 40 percent of change requests?
- > Customized impact assessment form used to review and approve/reject changes?
- > Every change formally followed up to confirm successful implementation?
- > 80 percent of changes confirmed as successful with demonstrable return on investment?
- > Information shared via knowledge management system (KMS)?

Do you have a resilient documentation system?

- > Policy documents that describe the why in less than five pages?
- > SOPs written by the user, for the user (not the inspector)?
- > SOPs that use more pictures, schematics and process flows than words?
- > Instructions start on page ONE?
- > Road tested and practiced before implementation, not rushed in?
- > Key policies and procedures reviewed annually, not every two to three years?

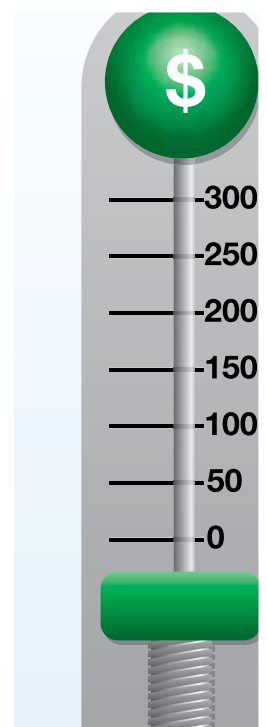
Do you have a resilient audit and self-inspection system?

- > Audit program based upon risk?
- > Audits completed by certified and fully trained auditors to ensure consistency?
- > Audits focus on prevention (fixing root cause), not short-term actions?
- > Escalation process for critical observations (within 24 hours)?
- > Formal review and close out of CAPAs?
- > Ratio of three self-inspections for every audit?
- > Results and findings trended and shared via KMS?

Do you have resilient risk management?

- > RM fully integrated into every aspect of your business?
- > People fully trained in risk-based decision making and not using “gut feel”?
- > Customized, objective impact assessment forms used for all decisions?
- > Simple risk register to provide management with overview of business risks?
- > Results and findings trended and shared via KMS?

TOTAL



CAN YOU TAKE THE HITS AND BOUNCE BACK STRONGER?

Continued How to thrive when the going gets tough – Your ORGANIZATIONAL RESILIENCE HEALTH CHECK

STEP THREE: REFLECTION AND ACTION PLANNING

- > Add up your scores and see how you fare on the resilience gauge below

YOUR RESILIENCE SCORE and WHAT IT MEANS



- 300 = Market Leader – just keep it up**
- 250 = You're in the top 10%**
- 200 = You're in the top 15%**
- 150 = You're competitive, but only just**
- 100 = There is hope, ACT NOW!**
- 50 = Your days are numbered!**

- > What are your top three vulnerabilities?
- > What actions must you take to become more resilient?

Please remember:

- > *The world today is one of turbulence, volatility, change and unpredictability.*
- > *In times of uncertainty, what worked yesterday may not work today.*
- > *Resilient companies are those with the ability to bounce back stronger*

Remember

“Victory awaits those who have everything in order; luck, people call it. Defeat is certain for those who have neglected to take the necessary precautions in time; this is called bad luck.”

Amundson

How we can help you prosper and succeed:

- > We believe that **complex, rigid structures and systems will not work**. Simple, adaptable and flexible ones will. If you want to simplify your systems to improve their resilience, we can help
- > We believe that **your success depends on what you STOP doing**. We can help you to focus
- > We believe that your **success depends on just doing the basics very well** and ignoring everything else. If you want to know more about the basics, we can help
- > We believe that it's **better to spend \$100 preventing** rather than \$100,000 reacting. It's also a lot less painful. If you want to focus on prevention, we can help
- > We believe that **Warning Letters and the like are a great opportunity to get back to basics** and build in resilience. If you're involved in remediation activities, we can help. We will leave you with systems and practices that will work. We don't believe in adding complexity
- > We believe your success depends on having **people who are educated, not trained**. If you want to know the difference, we can help

We hope this resilience health check has helped to gain a perspective on how to negotiate the changing landscape. Remember success awaits those who have everything in order. For more detailed information on more predictable surprises and some solutions, please contact me at **martinlush@nsf.org**

when hit by a predictable surprise. Not through luck, but by meticulous planning and preparation.

- > *If you have a resilience score above 200 you will turn uncertainty into commercial advantage.*
- > *Anything below, please give us a call.*

With thanks to references provided by Richard Dobbs, James Manyika and Jonathan Woetzel of the McKinsey Global Institute and authors of No Ordinary Distraction: The Four Global Forces Breaking all the Trends.

Success through Learning

Education: **The Facts**

- > It's predicted that by 2020 business will be short of 85 million workers with college degrees or vocational training. How will you cope?
- > The global shortage of talent will mean every company must work harder to keep talent. Remember, when you invest in education and development, people stay
- > See education as a cost and you will not compete in an unpredictable world. See education as a profit generator and you will generate more!
- > Ironically, traditional training methods fail to improve performance. What a waste!

How We Can Help: **Our Commitment to You**

- > Delegates tell us our courses are the best. "Fun", "Inspirational", "Invaluable", "Practical"
- > Every course is designed to improve behaviors and generate return on investment. Which is probably why so many come back for more
- > Our tutors have decades of experience. They really understand your challenges and can offer practical solutions that work
- > When you leave any course we don't leave you. We continue to offer support and advice free of charge. Delegates tell us this is invaluable
- > Take a look at the courses and locations inside. If you can't come to us, we can come to you. Customized, on-site courses are our specialty

January	February	March	April	May	June	
1	1 Pharmaceutical GMP Audits and Self-Inspections (An IRCA Certified Pharmaceutical QMS Auditor/Lead Auditor Course) ~ 5 days	1	1	1	1	
2		2	2	2	2	
3		3	3	3	3	
4		4	4 Pharmaceutical GMP ~ 3.5 days	4	4	
5		5	5	5	5	
6		2	3	5	6	6
7		3	4	6	7	7 Modern Process Validation ~ 3 days
8		4	5	7 Pharmaceutical Legislation Update ~ 1 day	8	8
9		5	6	8	9 QP Practical Module ~ 5 days	9 QP Alumni ~ 2 days
10		6	7	9	10	10
11		7	8 GMP for Biological and Biotechnology Products ~ 3.5 days	10	11	11
12		8	9	11	12	12
13		9	10	12	13	13 Investigational Medicinal Products ~ 4 days
14	10	11	13	14	14	
15	11	12	14	15	15	
16	12	13	15	16 Pharmaceutical GMP Audits and Self-Inspections (An IRCA Certified Pharmaceutical QMS Auditor/Lead Auditor Course) ~ 5 days	16	
17	13	14	16	17	17	
18 Pharmaceutical Packaging ~ 5 days	14	14 Quality Management Systems ~ 5 days	17	18 A-Z of Sterile Products Manufacture ~ 4 days	18	
19	15	15 Free QP Seminar for Prospective QPs & Sponsors ~ 1 day	18	19	19	
20	16	16	19	20	20 Risk-Based Decision Making in Sterile Products Manufacture ~ 3 days	
21	17	17	20	21	21	
22	18	18	21	22	22	
23	19	19	22	23	23	
24	20	20	23	24	24	
25	21	21	24	25	25	
26	22	22	25	26	26	
27	23	23	26	27	27	
28	24	24	27	28	28	
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30	26	26	29	30	30	
31	27	27	30	31	31	
	28	28				
	29	29				
	30	30				
	31	31				
					30 Rapid Change Control ~ 2 days	

Venues used:

Amsterdam Marriott Hotel,
Amsterdam,
The Netherlands

Renaissance Manchester City Centre Hotel,
Manchester, UK

Manchester Marriott Victoria & Albert Hotel,
Manchester, UK

Newcastle Marriott Gosforth Park,
Newcastle, UK

Hilton York Hotel,
York, UK

York Marriott Hotel,
York, UK

University of Strathclyde School of Pharmacy
Glasgow, UK

Training Course Calendar

July	August	September	October	November	December
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	3	4	4
5	5	5	4	5	5
6	6	6	4	6	6
7	7	7	5	7	7
8	8	8	6	8	8
9	9	9	7	9	9
10	10	10	8	10	10
11	11	11	9	11	11
12	12	12	10	12	12
13	13	13	11	13	13
14	14	14	11	14	14
15	15	15	12	15	15
16	16	16	13	16	16
17	17	17	14	17	17
18	18	18	15	18	18
19	19	19	16	19	19
20	20	20	17	20	20
21	21	21	18	21	21
22	22	22	19	22	22
23	23	23	20	23	23
24	24	24	21	24	24
25	25	25	22	25	25
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30	30	30	27	30	30
31	31	31	28		31
			29		
			30		
			31		

A-Z of Sterile Products Manufacture
~ 4 days

Pharmaceutical Legislation Update
~ 1 day

Active Pharmaceutical Ingredients
~ 4.5 days

Human Error Prevention
~ 3 days

Statistics for Ongoing Process Verification – Analyzing and Trending Data
~ 2 days

Medicinal Chemistry & Therapeutics
~ 5 days

Pharmaceutical GMP Audits and Self-Inspections
(An IRCA Certified Pharmaceutical QMS Auditor/Lead Auditor Course)
~ 5 days

Pharmaceutical Law & Administration
~ 5 days

Pharmaceutical GMP
~ 3.5 days

Free QP Seminar for Prospective QPs & Sponsors
~ 1 day

Risk-Based Decision Making for Quality Professionals and QPs
~ 2 days

Pharmaceutical GMP Audits and Self-Inspections
(An IRCA Certified Pharmaceutical QMS Auditor/Lead Auditor Course)
~ 5 days





Available 24/7:

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When faced with a laundry list of observations, please give us a call. We have decades of experience helping companies emerge stronger following a tough regulatory audit.

- > With offices in all five continents, we can help you quicker than most. We have an excellent understanding of local cultures and traditions, so vital to success
- > Our consultants are the very best. Ex-regulators, seasoned industry professionals and subject matter experts, all working to help you emerge stronger
- > We believe that successful remediation is down to the 3 Cs: Company Culture, Communication and Collaboration

- > Collaboration is vital. We will work with you to tackle root cause. Whether it is to change company culture, simplify systems, reengineer processes or improve workplace behaviors.
- > We believe “less is more”. We will help you decide what to stop doing and where to focus your resources

As your pharma biotech emergency service we will help you to deal with the initial trauma that accompanies tough inspections, triage (risk rank) what needs urgent attention to protect your business and then help you fix the underlying problems. Our objective? To help you emerge stronger as quickly as possible.



Regulatory Update

EU News

EU GMP Legislation

The European Commission is proposing to repeal the current EU GMP Directive 2003/94/EC and replace it with two separate GMP Regulations; one for marketed products and one for investigational products (IMPs). This is being done as a consequence of the new CT Regulation 536/2014, which should become effective on or sometime after May 28, 2016.

The Commission is of the opinion that these changes are necessary as Regulation 536/2014 requires that the Commission adopt delegated acts to specify the principles and guidelines of GMP and the detailed arrangements for inspection for ensuring the quality of IMPs. A consultation document on the new GMP for IMPs was published on August 28 and comments should be sent to the Commission by November 24, 2015.

FMD Implementation

In July 2015 the European Commission added Brazil and Israel to the list of countries judged to have API GMP equivalent to EU GMP. They have been added to the “white list” of countries who do not need to provide written confirmation of GMP with every API shipment into the EU.

These two countries are the first countries to be added to this list – which already had Australia, Japan, Switzerland and the USA as being approved – since this aspect of the Falsified Medicines Directive 2011/62/EU was implemented in July 2013.

On August 12, 2015 the Commission issued a draft Delegated Regulation setting out detailed rules for the implementation of obligatory “Safety Features.” Comments on the draft Regulation should be sent to the Commission by October 11, 2015. The main requirements proposed are as follows:

1. That the composition, format and carrier of the unique identifier will be fully harmonized across the EU. The unique identifier will be placed in a 2D barcode and contain the manufacturer code, a serialization number, a national reimbursement number (if present), the batch number and the expiry date.
2. Medicine authenticity will be guaranteed by an end-to-end verification system supplemented by risk-based verifications by wholesale distributors. Medicines will be systematically verified and subsequently decommissioned before being dispensed to the public; i.e. at the pharmacy level. Medicines at higher risk of falsification (returns or medicines not being distributed directly by manufacturers) will be additionally checked at wholesaler level.
3. The repository containing the unique identifiers will be set up and managed by stakeholders. National competent authorities will be able to access and supervise the database. The systems are to be paid for by the MA holders and manufacturers.

The lists containing the medicinal products or product categories which, in the case of prescription medicines shall not bear the safety features, and in the case of non-prescription medicines shall bear the safety features, were



by Pete Gough,
Executive
Director, NSF
Health Sciences
Pharma Biotech
Consulting

40 years' experience in pharmaceutical law, manufacturing, QC and quality systems. Now helping our partners understand ever-changing regulatory expectations to remain compliant.

populated in consultation with the Member States and are given as Annexes to the draft Regulation.

EU GMP Annex 1: Sterile Products

The concept paper states that a draft revision is expected to be published in October 2015, but at a PDA conference in June 2015, Andrew Hopkins, who is leading this revision, said that this was probably too optimistic and that the working group hoped to have a draft published in early 2016.

The draft structure of the revised Annex as of June 2015 is:

- | | |
|---------------------------|-----------------------------------------|
| 1. Scope | 8. Utilities |
| 2. Principles | 9. Production and specific technologies |
| 3. General | 10. Non-viable & Viable counts |
| 4. Product Quality System | 11. Quality Control |
| 5. Personnel | 12. Glossary |
| 6. Premises | |
| 7. Equipment | |

It is expected that the revised Annex will require sterile products manufacturing to be conducted in facilities equipped with isolators or RABS rather than in open facilities. This is being justified on the grounds that Directive 2001/83/EC Article 23.1 and Directive 2003/94 Article 5.2 require manufacturers to review manufacturing methods in light of scientific and technical progress.

EU GMP Annex 21: Importation of Finished Product

A concept paper on guidance for importers of medicinal products was published in May, with comments due in August, which will most likely be published as Annex 21. The scope of this new guidance “will be focused on importation activities not addressed in detail in the GMP guide and annexes, taking into consideration recent changes in GMP chapters and annexes

as well as changes in other regulatory documents.”

The problem statement in this concept paper states that further guidance is required on “the requirements applicable to importers of medicinal products and concerning the application of GMP requirements, which are traditionally oriented to activities performed at true manufacturing sites.”

A draft for public consultation is anticipated in early 2016.

ATMP GMP

Article 5 of Regulation 1394/2007 on advanced therapy medicinal products (ATMPs), which amended Directive 2001/83/EC, requires the Commission to draw up guidelines on good manufacturing practice (“GMPs”) specific to ATMPs. In late July 2015 the Commission issued a consultation document on GMP for ATMPs. Comments should be sent to the Commission by November 12, 2015.

The need for this separate ATMP GMP is puzzling as there is almost nothing in the consultation document that cannot be found in EudraLex Volume 4 and the Annexes. So it is unclear why the Commission is making this proposal rather than simply referring to EudraLex Volume 4 Part 1 and producing a new Annex to define the unique requirements for ATMPs, as it does for all other different product types, especially as we understand that this is what the GMP Inspectors’ Working Group recommended.

UK News

Compliance Reports

MHRA has published revised guidance and forms for both pre-inspection and interim compliance reports. The amount of information required to be submitted



has substantially increased. The information required now includes:

- > Products handled
- > Outsourcing
- > Sterility or media test failures
- > Batch failures
- > OOS results
- > Data Integrity; policy (yes/no), system admin. available during inspection

Product Shortages

MHRA is keen to avoid product shortages wherever possible. In a public meeting in March 2015 it stated it expects companies to have a plan to ensure continuity of supply of critical medicines. The QP should ensure that such plans exist and they should be reviewed as part of a company's self-inspection program. MHRA will check on these plans during GMP inspections.

MHRA Website

In a retrograde step, the excellent MHRA website has been closed and the Agency has been subsumed into the .gov.uk site that covers every aspect of the UK government. In the process a lot of valuable information, such as the Q&As, has been lost. The MHRA has launched a new blog at <https://mhrainspectorate.blog.gov.uk/> to provide some of the guidance that was lost when the site was forced to close.

ICH News

ICH Q7 – API GMP

A comprehensive Questions and Answers document on various aspects of the implementation of Q7 was published on 10 June 2015. This provides clarification on a range of questions relating to each of the 20 sections of the original Q7 GMP guide. A useful

annex provides a table cross-referencing each of the answers to the sections of Q7 and, where appropriate, to other ICH guidelines.

US FDA News

Allowable Excess Volume and Labeled Vial Fill Size in Injectable Drug and Biologics Products

This final guidance was published in June 2015 and is applicable to injectable products in vials and ampoules of both drugs and biologics submitted in NDA, BLA or ANDA applications. The intent is to clarify FDA regulatory requirements and prevent problems related to vial misuse and unsafe handling and injection techniques. The guidance complements USP Chapter 1151 on excess volume, noting that excess volumes are recommended to permit withdrawal of the recommended label amount, often described as overfill. The excess volume is generally not provided in the labeling. Departures in the excess volume from USP recommendations must be justified.

Established Conditions: Reportable CMC Changes for Approved Drug and Biologic Products

On June 1, 2015 the FDA published the draft guidance, Established Conditions: Reportable CMC Changes for Approved Drug and Biologic Products. This new draft guidance clarifies which changes to a pharmaceutical company's manufacturing process must be reported to the FDA, and how. FDA is concerned that some changes are being reported that need not be, while others that should be are not being reported.

The draft defines established conditions as "the description of the product, manufacturing

Regulatory Update



process, facilities and equipment, and elements of the associated control strategy, as defined in the application, that assure process performance and quality of an approved product.”

Analytical Procedures and Methods Validation for Drugs and Biologics

In July 2015, the FDA issued the final Guidance for Industry on Analytical Procedures and Methods Validation for Drugs and Biologics. This new guidance is designed to complement ICH Q2(R1) and replaces both the 2000 draft guidance and the 1987 approved guidance on Submitting Samples and Analytical Data for Methods Validation. It will apply to both drugs and biologicals but not to INDs/IMPs.

Quality Metrics

The FDA issued its draft guidance entitled Request for Quality Metrics on July 29, 2015. The FDA's intention is to use its authority to collect records “in advance of or in lieu of” an inspection, using the authority given by section 704(a)(4)(A) of the FD&C Act to gather various quality metrics data records. The agency says it will use these records to “further develop [its] risk-based inspection scheduling.”

FDA says it will request the following 10 baseline quality metrics from companies as part of its analysis:

1. The number of lots attempted of the product.
2. The number of specification-related rejected lots of the product, rejected during or after manufacturing.
3. The number of attempted lots pending disposition for more than 30 days.
4. The number of out-of-specification (OOS) results for the product, including stability testing.
5. The number of lot release and stability tests conducted for the product.
6. The number of OOS results for lot release

and stability tests for the product which are invalidated due to lab error.

7. The number of product quality complaints received for the product.
8. The number of lots attempted which are released for distribution or for the next stage of manufacturing the product.
9. If the associated annual product reviews (APRs) or product quality reviews (PQRs) were completed within 30 days of annual due date for the product.
10. The number of APRs or PQRs required for the product.

The agency is also asking for input on five “additional, optional metrics as evidence of manufacturing robustness and a commitment to quality.”

1. Senior Management Engagement: was each APR or PQR reviewed and approved by the following:
 - a. The head of the quality unit,
 - b. the head of the operations unit,
 - c. both, or
 - d. neither?
2. CAPA Effectiveness: what percentage of your corrective actions involved re-training of personnel (i.e., a root cause of the deviation is lack of adequate training)?
3. Process Capability/Performance: a “yes” or “no” value of whether the establishment's management calculated a process capability or performance index for each critical quality attribute as part of that product's APR or PQR.
4. Process Capability/Performance: a “yes” or “no” value of whether the establishment's management has a policy of requiring a CAPA at some lower process capability or performance index.
5. Process Capability/Performance: if “yes” to the previous question, what is the process capability or performance index that triggers a CAPA?



NSF QP Alumni

A Family of QPs

In early June we held our ninth Qualified Person Alumni meeting and, from an Alumni pool of several hundred who trained with us and a pool of 257 active QPs, were delighted to welcome a substantial group of delegates and speakers to the annual meeting.

Speakers included delegates, guests, NSF tutors and MHRA representatives, covering a range of topics from the latest legislation impacting the QP to non-technical skills training to help us all perform to our optimum as QPs.

Since its start as the DBA QP Alumni, this support and professional development network for QPs has grown from strength to strength, ably lead by volunteer Alumni officers Breda Quinn, Maria Adesida, Robert Smith and Giby George and facilitated by Mike Halliday and Stella Pearson-Smith from the NSF QP team.

The great thing about our QP program is that after the modules are completed, the contact continues with ongoing support. Alumni describe it as “a support network like no other; a real family of QPs.”

During one highly poignant session, the group was discussing how best to serve the next generation of trainee QPs. To be in a group with such highly motivated individuals discussing how they can work with the NSF tutors (who meet with the students on each module) to better select, support, mentor and sponsor the future QPs was inspirational. Not only do the Alumni members want to offer their colleagues the best training available, but they want to be the best sponsors they can be. One



of the most rewarding aspects of my job is seeing QPs I remember as delegates, many of whom I mentored and tutored, offering support to the next generation.

In addition the group continues to offer thoughts on course evolution to ensure that the NSF QP training syllabus offers the best and most relevant training for the QPs of today and tomorrow. I find the Alumni input into the course invaluable, as it ensures **we go beyond just the study guide and train the QP delegates in real-world techniques identified by today's active QPs.**

If you want to know more about our QP program or individual modules, please contact us on the number below or attend one of the free seminars (<http://bit.ly/1igKxJ5>) to talk to current and past students and the QP team.

If you want to reserve a place on the milestone tenth **NSF QP Alumni meeting on June 9-10, 2016**, our QP Administration team can also arrange this for you.



by Mike Halliday, Vice President, NSF Health Sciences Pharma Biotech Consulting

Responsible for our world class QP and IRCA education programs. With his unique training style and 30+ years' experience Mike is passionate about helping you get the most from your people.

For more information about our QP program or individual modules, please contact our **QP Administration Team on +44 (0) 1751 432 999**



Certification Learning



by Anne Davies,
Training Project
Manager, NSF
Health Sciences,
Pharma Biotech
Consulting

With over 30 years' experience in the pharma industry, Anne is passionate about making training and development of professionals effective within the related regulatory requirements.

Certification Objectives

In a pharmaceutical environment the quality of the product is heavily reliant on the knowledge and understanding of the people. They must know their products, their use and the production processes. Evaluating the processes will quickly highlight the 20 percent of roles that have 80 percent impact on the quality of the environment in which the products are produced. By focusing on this 20 percent and providing good education and a learning environment, we can start to ensure the whole process of manufacture and testing.

These roles include:

- > The batch reviewer
- > The quality event investigator
- > The auditor
- > The QC microbiologist
- > The aseptic operator (including the gowning process)

Setting the Scene

The first step is **defining the job description** for each role, specific to the job, site and working environment. It must define the relationship with others, key accountability and expectations.

It should include a general competency set for the role, including **skills, knowledge and behavior/attitude** expectations that can be observed and measured in some way.

Selecting the individual is critical, as each individual must be willing to learn and grow in the role, engaging in a learning contract with the organization that will provide a win-win situation for the individual and the company.

Tailoring the development plan for the individual is an important start to engagement in the path of learning. This must be entered into openly by all parties, and healthy discussion of topics and methods of learning will result in a far better level of commitment and understanding of goals and expectations. Learning and development does not happen overnight; the roles above are complex and

require deep levels of knowledge and skills.

Using a mentor or coach is essential. If this person is chosen early in the process, the relationship can build trust and respect from both parties, which is required for robust and open discussion throughout the development path.

Methodology-Rich Environment

Choosing a good mix of learning opportunities and methodology (blended approach) is essential to ensuring that the individual will be fully challenged and will get to develop their learning tools. However the main emphasis must be on **active learning**, both in the classroom and workplace, which ultimately provides the best outcomes. For example, the classroom allows a group to work as a team to solve a problem and to learn from each other through discussion, debate, feedback and presentations.

The environment of the workplace is equally important. It can be supplemented by adding challenges to the role, spending time with colleagues doing a different role and choosing projects to stretch the competencies that need to be developed. The **allocation of a project** for the individual is a rich environment for learning. Chosen carefully and with the right business backing, it can create opportunities for individuals beyond their day-to-day roles and benefits for the organization.

Assessment and Evaluation

Good evaluation practice includes using concrete measures for learning, asking *What have they learned?* and *Do they use it?* Clear guidelines for how to **measure success** should be established prior to commencing any activity in the learning path. These can be a mixture of learning objectives/outcomes and business objectives/outcomes. Milestones and key activities should be identified. For example, if a learning event is for the individual to spend one week in another working environment, then the expectations of this week should be laid out and could include a new way of approaching a task or a review of current practice.

g Path to Excellence

Learning Methodology

1. Inquiry-based learning

Through asking challenging questions, learners get intrinsically motivated to start delving deeper to find answers to these questions and in doing so they are exploring new avenues of knowledge and insight.

2. Problem-based learning

Students engage complex, challenging problems and collaboratively work toward their resolution. Problem-based learning is about students connecting disciplinary knowledge to real-world problems—the motivation to solve a problem becomes the motivation to learn.

3. Active learning

Students take greater control over their learning and as such the learning is open-ended and not always predictable. Active learning brings together all of the interactions that students have in the workplace and in the classroom (e.g. case studies, group work, role play).

- > Observation by peers and SMEs – need to be formalized and, as far as is practicable, objective
- > Feedback and discussion – generally should be recorded
- > Learning log of events and progress (per activity and/or overall) – entered by the learner and reviewed by an agreed assessor
- > Simulations with hidden errors
- > Performance reviews for job tasks
- > Presentations

Knowledge assessments after classroom events provide hard evidence that the right knowledge is taken away. Targets are harder to set in the workplace, and must use tangible measurements such as *Has the performance improved with respect to audit reporting?* or *Did we see a good use of decision making techniques during an event investigation?* Checklists of performance or observed behavior carried out by assessors provide hard evidence. Assessments and evaluation techniques must be agreed prior to any event and aligned with the objectives of the event. It is no good trying to measure something that was never there in the first place. The people doing or setting the assessments need to understand the process, be impartial and understand the learning objectives.

Selection and education of the workplace assessors therefore is crucial to the success of the learning path. Assessors may not be necessarily the same person as the coach or mentor; in some circumstances it will need to be a local SME.

Evaluation Methodology

Variation and appropriateness of the process are key to success. Choosing the right method for measurement and the right timing will maintain a level of fairness, openness and honesty. Methods typically should include:

- > Knowledge questionnaires – either paper or electronic

Reaching the Finish Line

The certification process for individuals is both intrinsic to their job activities and also very emotionally linked to their personal satisfaction in the workplace. Reaching the final approval stage will need to be recognized appropriately within the culture of the organization. Records of the process need to be formalized and if the particular certification requires re-evaluation or recertification after a period, the initial document should display this.



YOUR MEDICINES ARE ONLY AS GOOD AS YOUR PEOPLE: THE BENEFITS OF AN ON-SITE TRAINING COURSE

by Martin Lush

Finance Director:

“What happens if we train these people and they leave?”

CEO:

“What happens if we don't and they stay?”

Over the last 30 years, NSF Health Sciences (previously David Begg Associates) has become the leader in providing customized education courses. Our objective is simple. Our courses change the way people think and, in doing so, provide an immediate return on investment. For example, fewer rejects, better compliance, better decisions and simpler and faster systems.

The benefits of us coming to you are considerable:

- > Content is customized to meet your exact needs and requirements
- > You leave with your problems fixed and your questions answered
- > No travel or hotel costs
- > No time away from home and family
- > Less work disruption
- > Everyone listens to the same message, creating real momentum for change
- > Better return on your investment
- > Ongoing support from NSF after the course

Here are some of our most successful on-site courses. For more information, please contact pharmamail@nsf.org or call +44(0)1751 432 999

LEADERSHIP, QUALITY CULTURE AND CHANGING GMP BEHAVIORS

- > Quality Culture: How to create a culture that improves profit and compliance
- > Changing GMP Behaviors: A simple five-step process
- > Quality Systems – Best Industry Practices: Find out what the best companies do
- > How to Change Quality Habits: Getting people to do the right thing, automatically

- > How to Communicate with Senior Management: And not be ignored
- > Managing Quality Across Cultures: Understanding the behaviors that drive the actions
- > Vital Leadership Skills for the Pharmaceutical Professional: How to make a difference

CONTINUOUS IMPROVEMENT, ERROR REDUCTION AND SIMPLIFICATION

- > Human Error – Causes and Prevention: 5 steps to improving human reliability
- > Advanced Problem Solving: Taking your root cause investigations to another level
- > Reducing Documentation Errors: Pure and simple
- > The Art and Science of Simplification: How to remove deadly complexity
- > Batch Record Simplification: How to reduce errors and speed up review time
- > The Analysis and Trending of Data: Using your data to drive improvement

REGULATORY COMPLIANCE, INSPECTIONS AND DATA INTEGRITY

- > EU GMP and Inspection Readiness: How to succeed on the day
- > FDA GMP and Inspection Readiness: How to succeed on the day
- > Thinking Under Pressure: How to make the right decisions no matter what
- > Warning Letters: Causes and prevention
- > Regulatory Crisis Management – Best Industry Practices: What to do when things go wrong
- > Data Integrity: How to manage DI issues and prevent them in the first place
- > Regulatory Update: What new regulations are coming and how to interpret them
- > Pharmaceutical Law: A no nonsense, practical interpretation of pharmaceutical regulations

PLANT AND UTILITIES

- > The A-Z of Pharmaceutical Water Systems: Everything you ever wanted to know
- > The A-Z of HVAC Systems: Everything you ever wanted to know
- > Good Autoclaving Practices: The control and management of your autoclaves
- > GMP for Engineers

MANUFACTURING PROCESSES AND SYSTEMS

- > The A-Z of Sterile Product Manufacturing
- > Process Simulations and Media Fills: Best-in-class practices
- > GMP for Biotechnology Products
- > The A-Z of the Manufacture of Tablets and Capsules
- > The A-Z of the Manufacture of Liquids, Creams and Ointments
- > The A-Z of the Manufacture of Metered Dose Inhalers
- > Pharmaceutical Packaging: Minimizing risk in this high-risk area
- > Modern Approaches to Validation
- > Computer System Validation: The essentials

QUALITY SYSTEMS AND GMP

- > The A-Z of Quality Management Systems
- > Pharmaceutical GMP: How to excel at the doing the basics
- > Deviation and CAPA Systems: How to prevent repeat incidents – five easy steps
- > Rapid Change Control: How to review and approve changes in minutes
- > Customer Complaints – Management and Control: Best industry practices
- > Product Recalls – Management and Control: Best industry practices
- > Good Documentation Practices: How to create documents people can use
- > Product Quality Review: Using data to drive continuous improvement
- > The Cost of Poor Quality: Improving margin by reducing waste
- > Annual Product Quality Reviews: Using APRs to drive continuous improvement
- > EU GMP Requirements for Clinical Supplies Manufacture

- > Good Distribution Practices: How to keep your product fit for purpose
- > The Management and Control of Third Parties: Best industry practices
- > Training Effectiveness: How to improve the effectiveness of your training programs
- > Key Performance Indicators: Selecting measures that tell the truth and drive improvement

QUALITY CONTROL AND LABORATORY ACTIVITIES

- > Good Control Laboratory Practices: The chemistry lab
- > Good Control Laboratory Practices: The microbiology lab
- > Out of Specification Investigations: Best industry and regulatory practices
- > Ongoing Stability: Regulatory and best-in-class practices

RISK MANAGEMENT AND RISK-BASED DECISION MAKING

- > Risk-Based Decision Making: How to make the tough decisions
- > Risk-Based Decision Making in Sterile Product Manufacture

CONTROL OF CROSS-CONTAMINATION (CHEMICAL AND MICROBIOLOGICAL)

- > Cleaning Validation: Science based, pragmatic, pure and simple
- > Pharmaceutical Microbiology for the Non-Biologist: Demystifying the “black art”
- > Risk-Based Approach to Environmental Monitoring: Getting the most from your EM program

AUDIT AND SELF-INSPECTION

- > Pharmaceutical GMP Audits and Self-Inspections: Certified auditor course
- > How to Audit – Bulk Biotech Operations
- > How to Audit – Sterile Products Manufacture
- > How to Audit – Data Integrity
- > How to Audit – QC Chemical Laboratories
- > How to Audit – Chemical API
- > How to Audit – Computer Systems



A17638

IRCA Certified Pharmaceutical GMP Auditor Training

by Mike Halliday

It's not unusual to hear of the popularity of our training courses and our tutors. However, after 12 years with NSF, I still sometimes get pleasant surprises.

Since 2011 when our Effective Pharmaceutical Audits and Self-Inspections course was first certified by IRCA (the International Register of Certificated Auditors) as a pharmaceutical GMP Lead Auditor course, to recent months, welcoming the 600th delegate to our course. An astounding success story even for us.

The course focuses on the pharmaceutical industry, its contractors and suppliers, and specific GMP legislation, not just general ISO standards. Our hugely experienced tutors (former inspectors and industry auditors) have an average of 30 years' experience.

Auditor continuing professional development is important to us. We offer a very popular

GMP legal update webinar specifically for auditors who have attended the course. This brings them up to date with the new GMP expectations and requirements that auditors should be looking for. We also help auditors choose on-site or public courses to expand their areas of expertise or to improve technical skills in different dosage forms for auditors having to audit new processes.

Rewards for Loyalty

On-site or in-house training offers the most cost-effective way to deliver a targeted and consistent message to a group of your colleagues. Whether it's a modular training program based on our world-class QP course, an on-site auditor course or almost any of our other courses, we can help.

After realizing that many companies have trialed one of the public courses with one delegate and then decided to bring it on-site to a wider group, we are pleased to be able to offer a reward for this extra loyalty. By bringing the course on-site to a group of 15 or more delegates, in certain circumstances your course fees for the public course will be refunded in full. If you or a colleague have attended a public course with us and you would like us to provide the course on-site at your company within the same calendar year, please contact us – you may be surprised.



We offer ongoing on-site training and public courses in the USA, UK, mainland EU and Asia Pacific. Please see <http://bit.ly/1JbwRoj> for the schedule or contact us at **+44 (0) 1751 432 999** if you would like more information.





Health Sciences
Pharma Biotech
Consulting

News...

Nicholas Markel



NSF Pharma Biotech would like to welcome Nicholas Markel to our US team. Nicholas joins us as an Executive Director, reporting to George Toscano, Vice President, Pharma Biotech

Quality Systems. He has 25 years' experience in the biopharmaceutical field and 15 years of experience providing general and strategic consultation to domestic and foreign clients in the biotech, biologic and pharmaceutical industries, assisting with manufacturing issues, development of quality systems and regulatory strategies.

Nicholas's areas of expertise include techniques used in biopharmaceutical production for human use, review and development of quality systems, conducting cGMP compliance audits, deviation investigation, CAPA generation and implementation, oversight of manufacturing contractors and manufacturing activities, overall project management, commissioning of new and revised facilities, process validation, man-in-the-plant services to oversee operations and compliance.



Happy NSF Birthday Bob!

Congratulations to Dr Bob Pietrowski who celebrated 25 years' service with us in August! Some of you may remember Bob from his days as Partner at David Begg Associates, however, through the years he's seen a great deal of change in the industry and has played an integral part in ensuring the company has grown and evolved alongside these changes. We are now extremely privileged at NSF to have Dr Pietrowski as Vice President of Global Health Sciences, still with the same motivation and beliefs as when he first started – protecting and improving human health.

Thanks Bob, and here's to at least a few more years!



Rachel Carmichael

We are delighted Rachel Carmichael will join our UK office as an Executive Director for NSF Health Sciences Pharma Biotech on October 1, 2015.

Rachel has been an MHRA Inspector since December 2004, gaining a wide understanding of the pharmaceutical industry, GMP and quality management around the world. In addition Rachel has considerable blood and blood products experience.

Prior to joining the MHRA, Rachel had several roles in the pharmaceutical industry, ranging from the technical in manufacturing

to the packing of oral solid dose products. She is an eligible Qualified Person.

Rachel holds an MSc from the University of Brighton in industrial pharmaceutical studies, an MSc from the University of Strathclyde in marketing and a BSc (Hons) from the University of Dundee in biochemistry.

On a personal level, Rachel completed the second year of her BSc at the University of Illinois, Champaign Urbana, where her top grades were (oddly enough) in conversational French and art appreciation. While her French has faded over the years, her interest in art remains and she is particularly looking forward to exploring the Bowes Museum following her move to the North of England.



NSF Collaboration With Indian Drug Association – QP Education in India

Over the last 20 years we have educated more Qualified Persons than any other training provider in Europe. Of the delegates who undergo independent assessment, 98 percent pass, which is the highest pass rate of any training provider over a 20-year period. Working in close collaboration with the Indian Drug Manufacturers' Association (IDMA), we intend to launch a similar program of education for the Indian pharmaceutical industry in 2016.

Who Is the IDMA?

The IDMA was formed in 1961 and is one of the most respected industry organizations in India.

Its membership includes over 800 large, medium and small wholly Indian companies and state boards throughout India

More than 70 of its member companies have over 170 US FDA approved facilities.

In addition to its very strong industry links, the IDMA also works very closely with regulatory agencies across the world.

QP style education in India: Why?

NSF is passionate about doing everything possible to improve the health of people across the world. It's why we exist.

Health care systems worldwide depend on India for the supply of safe and effective medicines: It is the world's largest supplier of generic medicines. Turnover in the Indian pharma industry has grown exponentially from approximately \$2 million US in 1948 to over \$32 billion in 2014.

In short, a healthy and vibrant Indian pharma industry equals a healthy global population. To achieve this, Indian companies must be trusted, compliant and modern in their practices across the product lifecycle. This all depends on the quality of people and the routine decisions they make.

What will the program look like?

The content of this modular program will be based on the study guide used to educate QPs in the UK, which is recognized as the most comprehensive and rigorous in the EU.

A Tripartite Collaboration Aimed at Creating and Building a Pragmatic Approach to Successful Investigations

by Rocco Duran

There is a rapid pace of change within the pharma biotech industry, which includes the availability of breakthrough drug treatments, the greater prominence of biotechnology therapies, a regulatory shift focusing on controlling risk and a marketplace that places a high premium on the availability of safe and effective products; however one thing that is fundamental to securing a strong supply of high quality products but continues to remain a challenge for industry, is the ability to conduct thorough and robust investigations of product quality issues when they occur.

Well, that is about to change! NSF Health Sciences Pharma Biotech Consulting, a division of NSF International has teamed up with the Parenteral Drug Association (PDA), a global leading provider of science, technology and regulatory information and education for the biopharmaceutical community and industry representatives to design, develop and deliver a pragmatic and innovative course on conducting effective investigations.

News...

Manufacturers'

by Martin Lush

The program will be presented by NSF course tutors from the UK. Delegates will be assessed by written examination to demonstrate competency and understanding.

Just like our UK-based course, modules will be highly interactive. Case studies and problem solving exercises will be used to challenge understanding and decision making. Our ultimate objective is to change the way people think, not just to educate and inform.

What's next

The IDMA will publicize details of the program to its members and NSF will inform clients with Indian plants and affiliates.

If you would like advanced information of program content, please contact martinlush@nsf.org.

NSF HEALTH SCIENCES CONTINUES EXPANSION PLANS IN US CONSULTING BUSINESS

NSF Health Sciences announces the addition of Libertyville, IL-based consulting firm Avarent to its NSF Medical Device Consulting business. The acquisition of Avarent builds on NSF's 2012 acquisitions of Washington, DC-based regulatory compliance consulting firm Becker & Associates and UK-based medical device training and consulting firm Pink Associates. Under its new name, NSF Avarent will expand NSF's portfolio of medical device services to include product/process development, design control and validation.

Together, NSF and Avarent will provide more comprehensive services that help firms increase the efficiency of the medical device design and manufacturing process while reducing risk and ensuring optimal quality and regulatory compliance throughout the product lifecycle.



What makes this course unique is the cross-functional representation from a non-profit company, a trade group and industry experts who are passionate advocates of assisting the industry in its quest to deliver high quality, low cost and readily available products to the marketplace.

Additionally, this is an exciting and innovative effort because the team is applying educational concepts, tools and techniques that will deliver transformational and impactful investigational outcomes.

In the early phase of course design, the team has focused on identifying root causes that continue to make this a challenging and difficult area for industry. This will then assist the team, in developing cutting edge educational content that will deliver engaging, pragmatic and effective investigational approaches.

The most innovative underpinning of this course is that it focuses not only on the mechanics of investigation and investigative processes, but also highlights some of the often ignored or ignored aspects of investigative methodology which are related to human cognition and behavior at the individual employee and organizational level.

It is anticipated that this course will be finalized and ready for launch towards the end of this year or early next year.

Lab Insights – Going “Glocal” to Optimize Customer Solutions

by James Scull and Benjamin Koepsell, Bristol and Erdmann laboratories

NSF is a science-based organization. Under the spotlight in this issue are two labs with very specialized testing capabilities.

NSF Health Sciences’ Bristol Laboratory operates in 15,000 ft² (1,394 m²) of custom designed laboratory space located in Bristol, Connecticut, USA, providing solutions for the pharmaceutical, medical device and biotechnology industries. The Bristol facility, which is FDA registered and DEA licensed, operates as an NSF Center of Excellence for extractables and leachables (E&L) studies for pharmaceutical packaging, medical devices and single-use processing equipment.



The staff of 30 people has a wide depth and breadth of experience in the design and execution of E&L and preclinical development programs to meet both FDA and international regulatory requirements.

Led by General Manager Dr James Scull and Director of Research Dr Kurt Moyer, the laboratory excels in delivering superior scientific solutions for extremely complex analytical challenges that most other labs shy away from. Staff members are recognized thought leaders, participating on various committees developing best practices for testing across the industry. The laboratory has conducted studies for more than 100 clients from around the world, spanning

the full development spectrum from discovery support through manufacturing.

With nearly 36,600 ft² (3,400 m²) of laboratory space in Rheda-Wiedenbrück, Germany, NSF Erdmann Analytics serves as a leading laboratory for food producers and traders, and as a strategic location for Central Europe. Two-hundred employees including 30+ scientific experts work effectively to achieve quick results serving customer satisfaction. The laboratories provide professional services and offer comprehensive microbiological, molecular-biological, histological and chemical analytics for food. The main focus is the analysis of meat and meat products, fish, delicacies, salads, convenience foods, pet and livestock feed, the analysis of pesticide residues on fruits and vegetables, and drinking water analysis.



As an accredited laboratory, NSF Erdmann Analytics provides routine testing of products as well as flexible, custom services through state-of-the-art laboratory equipment and skilled, continuously trained expert staff.

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