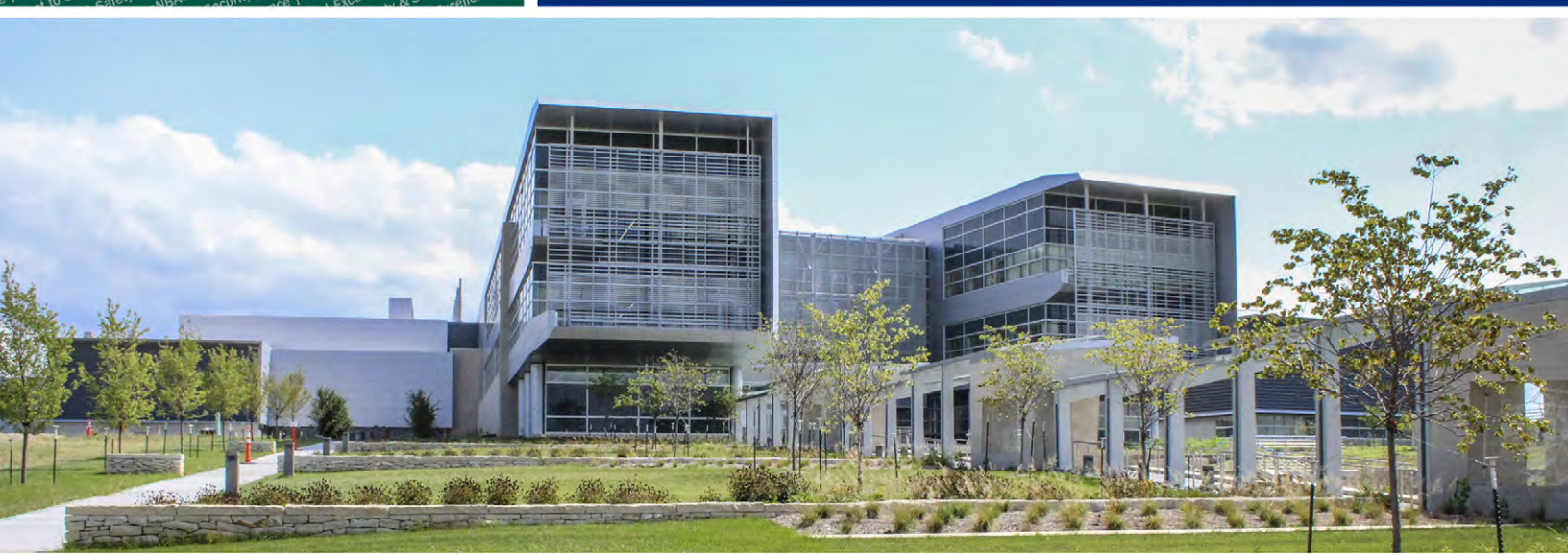


National Bio and Agro-Defense Facility

U.S. DEPARTMENT OF AGRICULTURE

To protect the United States against transboundary, emerging and zoonotic diseases that threaten our food supply, agricultural economy and public health.



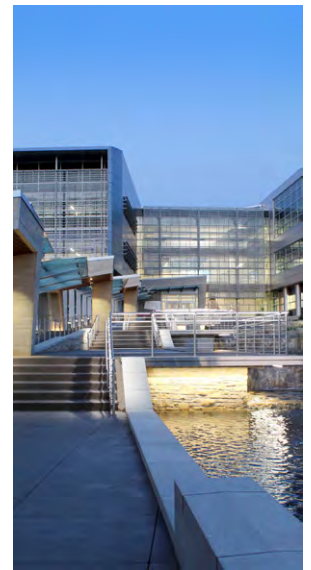
OneNBAF Blueprint for Excellence in Safety and Continuous Improvement

Building and Sustaining a High-Reliability Organization (HRO)

A commitment to excellence in safety and continuous improvement.

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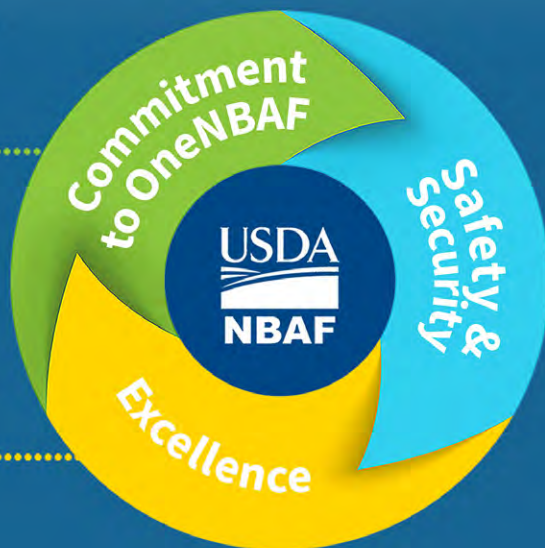


*OneNBAF Blueprint
for Excellence
in Safety
and Continuous
Improvement.*

*Building and
Sustaining a
High-Reliability
Organization (HRO).*

We are dedicated to working together to leverage the unique capabilities of ARS and APHIS. Only united, as OneNBAF, will we achieve our mission.

We meet challenges by empowering and inspiring one another to achieve quality and excellence through continuous improvement.



We hold ourselves accountable for the safety and security of each other, our environment, and our community.





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DIRECTOR'S MESSAGE



Director's Message

Over the past four years, we have dedicated significant efforts to foster the development of the NBAF culture. From the onset, the NBAF mission has been clear:

“To protect the United States against transboundary, emerging, and zoonotic diseases that threaten our food supply, agricultural economy, and public health.”

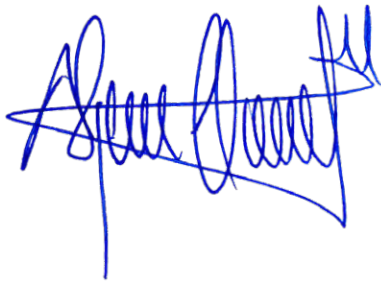
With the valuable contributions of our staff, we established a set of core values and associated behaviors that serve as the foundation of our organization. These values provide us with a moral compass, guide our decision making, and set a standard for assessing our actions. Building the OneNBAF culture is an ongoing endeavor that requires dedication, patience, and active participation from each one of us. While leadership sets the example, it is up to all individuals to cultivate this culture through their daily actions and choices. These values are deeply aligned with the core principles of becoming a High-Reliability Organization (HRO).

In the realm of high-risk organizations, particularly in a high-containment laboratory like NBAF, the concept of an HRO holds great significance and transformative potential. In a world where complex systems and high-risk environments are a reality, understanding and implementing the principles of HROs can make the difference between success and crisis. Establishing a culture of high-reliability within NBAF is a complex and continuous process that involves continuous improvement, leadership, communication, training, and a solid commitment to safety.

The concept of an HRO teaches us invaluable lessons about our commitment to safety, resilience in the face of adversity, and the power of our culture in shaping outcomes. The principles of HROs inspire us to strive for excellence, remain vigilant about the potential for failure, and foster organizations where safety and reliability are not mere priorities, but fundamental core values that guide our actions. Only through the consistent implementation and reinforcement of our expected behaviors can we succeed as OneNBAF.

The development of an HRO represents an exciting and necessary step in our journey. Together, we can create an environment where collaboration, empathy, accountability, adaptability, psychological safety, and continuous learning are not merely ideals, but a way of life. The Senior Leadership Group (SLG) is committed to this, and I invite every member of the NBAF team to embrace this initiative, for in doing so, we will build a stronger, more resilient, and more successful organization. However, building an HRO requires more than just a set of principles—it necessitates a profound cultural shift. It demands the commitment of every individual within NBAF, from the Director to the frontline staff, to prioritize continuous improvement, open communication, and an unwavering pursuit of excellence.

Thank you. And let us embark on this journey together.



Alfonso Clavijo, DVM. PhD.
NBAF Director
National Bio and Agro-Defense Facility (NBAF)
U.S. Department of Agriculture (USDA)



To protect the United States against transboundary, emerging and zoonotic diseases that threaten our food supply, agricultural economy and public health.



NBAF's Commitment to Excellence

NBAF is at the forefront of safeguarding our nation through effective partnerships, cutting-edge training, innovative diagnostics, and the development of preventive technologies through cutting-edge research.

In 2018, the U.S. Department of Agriculture (USDA) launched the “OneUSDA” initiative, which emphasizes collaboration and unity across all offices and agencies. Rather than operating in silos, we acknowledge the interconnectivity of our work, understanding how the efforts of one team can enhance or influence those of another.

At NBAF, we have a distinctive advantage with both APHIS and ARS being located within one facility. NBAF leverages the combined strengths of ARS and APHIS, with each agency playing specific and complementary roles. Through the implementation of our innovative OneNBAF approach, we empower each agency to optimize their unique skills, strengths, and capabilities in the development of cutting-edge diagnostics and advanced veterinary medical countermeasures. Only as OneNBAF, we will have the ability to meet the future challenges by empowering and inspiring one another to achieve quality and excellence through continuous improvement.

As a global leader, NBAF is dedicated to following a set of core values that form the foundation of a High-Reliability Organization (HRO) framework. This framework serves as a guiding structure for NBAF staff, enabling them to strive for operational excellence and cultivate a safety and security culture that can be emulated by other life science institutions worldwide, ensuring a safer organization for all.

The National Bio and Agro-Defense Facility (NBAF) is working to become a High-Reliability Organization (HRO). As an HRO, all staff at NBAF are not only committed to but are expected to perform in an exceptionally safe, efficient, and effective manner. NBAF, as other high-containment laboratories, functions in a high-risk environment where the potential for harm is a constant factor, yet NBAF staff recognize their responsibility to maintain the HRO practices described in this document to mitigate the risk to themselves, each other, and the community.



NBAF is a leader in protecting our nation through productive partnerships; advanced training; diagnostic innovation; and discovery of preventative technologies.



Executive Summary

The purpose of this document is to present a comprehensive and long-term NBAF strategy for building and sustaining a High-Reliability Organization, focused on achieving excellence in safety, fulfilling the NBAF mission, and upholding NBAF's core values and behaviors. **A high-reliability organization (HRO) is an organization that is exceptionally consistent in accomplishing its goals and avoiding potential catastrophic errors despite operating in complex, high-risk, or hazardous environments.**

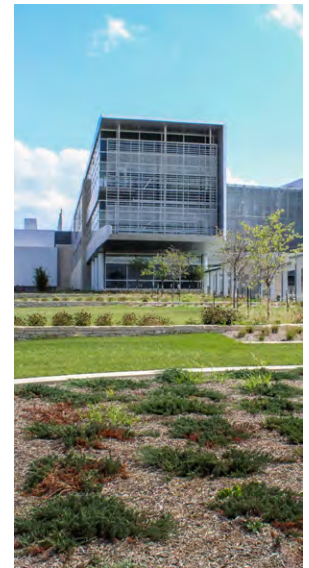
Efforts to improve the safety, reliability, and effectiveness in high-risk industries and environments are not new; organizations have been diligently working toward these goals for years. However, they often pursue various strategies in a vacuum, not fully appreciating how different approaches and initiatives impact one another. When attempting to achieve more ambitious goals, these organizations sometimes need guidance on how to integrate and sequence their improvement efforts.

This document serves as a reference for current and new employees, and provides a strategic vision for all NBAF staff. It is important to note that this document does not replace safety protocols, policies, or programs; rather, it articulates NBAF's core values, HRO principles, and strategic objectives for becoming an HRO. By actively participating in the HRO Strategic Objectives as OneNBAF, this document aims to encourage and empower all staff to embrace the NBAF culture.

We describe the pillars of the NBAF culture, providing definitions and implementation strategies for these pillars (Leadership, Quality, and a Culture of Safety). These pillars form the foundation for maintaining the highest levels of reliability within our organization. We developed six strategic objectives that align our core values and HRO framework to ensure excellence in safety and security, as well as foster continuous improvement in all aspects of our work, while working as OneNBAF.

The hallmark of a high-reliability organization is not that it is error free, but that errors don't disable it.

We expect that the concepts described here will offer NBAF with a clearer understanding of how to achieve safe, reliable, and effective operations. Additionally, other high-containment laboratories can use the framework as a roadmap in applying the principles contained therein, or as a diagnostic tool to determine how well (or even if) they are pursuing the different components of the framework. Application of the framework — and a commitment to safety and continuous improvement — will enable laboratories of all shapes and sizes to take the next step toward achieving safe and reliable operational excellence.



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NBAF Mission and Vision

The National Bio and Agro-Defense Facility (NBAF) will be a leading global center for animal health. NBAF is a USDA facility operated by two USDA agencies: the Agricultural Research Service (ARS), USDA's chief intramural research agency, and the Animal and Plant Health Inspection Service (APHIS), USDA's lead agency in ensuring the health and care of animals and plants.

We are confronted with a global challenge that underscores the critical importance of research and diagnostics of transboundary and emerging diseases. The recent outbreaks of novel pathogens have highlighted the urgency of understanding, combating and ultimately preventing the spread of infectious diseases in livestock. In an interconnected world where pathogens know no borders, transboundary and emerging diseases pose a significant threat to animal and public health, economic stability and societal well-being. Animal and zoonotic diseases have the potential to threaten our food supply, agricultural economy, and public health. NBAF's work will protect the United States against these transboundary, emerging, and zoonotic animal diseases through research, vaccine and anti-viral development, as well as enhanced diagnostic and training capabilities. These activities are carried out within a safe, secure, and sustainable biocontainment facility.

NBAF Mission:

To protect the United States against transboundary, emerging, and zoonotic diseases that threaten our food supply, agricultural economy, and public health.

NBAF Vision:

A safer and more resilient America through a world-class science facility for large animal agricultural research, training, and diagnostics.

To fulfill NBAF's mission and vision, USDA has established strong relationships with stakeholders, collaborating to set program priorities and forge partnerships at regional, national, and international levels. NBAF actively collaborates with academia, industry, other federal agencies, livestock and veterinary associations, as well as partner countries, leveraging resources and expertise to achieve shared goals.

Research and diagnostics are our most potent weapon in the fight against transboundary and emerging animal diseases. By deepening our understanding of the epidemiology, transmission dynamics, and pathogenesis of these diseases, we can develop more effective surveillance, prevention, and control strategies. From diagnostic tools and vaccines to biosecurity measures and risk assessment frameworks, research empowers us to stay one step ahead of emerging threats and mitigate their impact on animal and human health.

As we embark on this journey together, let us remember that the true measure of our success lies not only in the discoveries and preventative measures our scientist will make but also in the positive impact that together we can have on the world around us.



MISSION

To protect the United States against **transboundary, emerging, and zoonotic animal diseases** that threaten our food supply, agricultural economy, and public health.



*A safer
and more resilient
America through
a world-class
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National Bio and Agro-Defense Facility
U.S. DEPARTMENT OF AGRICULTURE

To protect the United States against transboundary, emerging and zoonotic diseases that threaten our food supply, agricultural economy and public health.

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CORE VALUES



Our Core Values

Commitment to OneNBAF
We leverage the capabilities of AIS and APHS by:

- Collaborating and sharing information between agencies
- Making the visitor the first concern of the staff member
- Serving each other to enhance the NBAF mission
- Considering the effect of our work and actions on others

Excellence
Our excellence is reflected in our efforts to:

- Set high standards and expectations for quality and timeliness
- Communicate clearly, openly, and transparently
- Identify opportunities to improve our work processes
- Value diversity and innovation

Safety & Security
We make safety and security a priority by:

- Empowering each other to take responsibility
- Maintaining personal and structural awareness
- Understanding and following government and procedural
- Speaking up when something doesn't look or feel right

NBAF Core Values

Only by working together, in service to our country, can we fully prevent, prepare for, and mitigate transboundary animal and zoonotic disease outbreaks before they escalate into public health emergencies. Our core values drive our organization to achieve its mission, reach its goals, and guide our decisions and behaviors.

NBAF leaders and staff collaborated to develop the facility's core values and behaviors, which form the foundation of our OneNBAF culture. It is essential that we commit to these values in everything we do to ensure our overall operational success.

1. Commitment to OneNBAF: We are dedicated to working together to leverage the unique capabilities of ARS and APHIS. Only united, as OneNBAF, can we achieve our mission.

We demonstrate our commitment to OneNBAF by:

a) Collaborating and sharing information between agencies: We value and promote a culture of knowledge and information sharing. Although APHIS and ARS have distinct missions, they complement each other. The collective knowledge possessed by the staff at APHIS and ARS within NBAF is one of our most valuable assets, enabling our staff to excel. Actively sharing information across agencies at NBAF is vital to our success.

b) Making decisions in the best interest of the NBAF mission: Every decision made at NBAF, regardless of level or function, impacts us all. To succeed, we must consider the overall interests of NBAF, even if it means making sacrifices at the unit, section, or agency level.

c) Serving each other to advance the NBAF mission: We work together across units to serve NBAF's mission. In doing so, we act as internal customers to each other, ensuring cross-functional coordination, communication, and collaboration as needed.

d) Considering the effect of our work and actions on others: Given the interdependency across operational and scientific units at NBAF, we must be mindful of how our decisions and actions may impact other teams, sections, and units. This consideration may involve improved communication, information sharing, consultation, and joint decision-making.

2. Excellence. We meet challenges by empowering and inspiring one another to achieve quality and excellence through continuous improvement.

Our excellence is reflected in our efforts to:

a) Set high standards and expectations for quality and integrity: We consistently set high performance standards and refuse to settle for mediocrity. Together, we carry out our work in teams and across units, demonstrating integrity through shared values of honesty, loyalty, respect, and responsibility.

b) Communicate clearly, openly, and respectfully: A culture that supports quality and safety relies on teamwork and effective communication. Successful teamwork correlates with improved quality and safety and aligns with our HRO efforts. Our culture values teamwork and continuous learning. To sustain effective teamwork, NBAF must ensure clear and transparent two-way communication, enabling us to resolve conflicts quickly and learn from one another. Effective and transparent communication fosters psychological safety, empowering everyone to speak up and share challenges, ideas, and solutions.

c) Identify opportunities to improve our work processes: Only through our collective and ongoing efforts at NBAF can we make changes that lead to improved quality



Together, we carry out our work in teams and across units, demonstrating integrity through shared values of honesty, loyalty, respect, and responsibility.





Situational awareness is critical to successful decision making in any potential situation at work, particularly in an environment like NBAF.

and safety outcomes, enhanced system performance, and professional development. Continuous learning is another vital component of our process improvement. We must maintain a transparent, reliable, and supportive learning system that promotes improvement and growth.

d) Value diversity and innovation: Fostering a culture of diversity and inclusion for people of all backgrounds, lifestyles, and perspectives is critical to ensuring NBAF's excellence in its facility operations and future science initiatives. We will continue our efforts in building a culture where everyone feels free to contribute ideas, feels valued for their contributions, receives credit for contributing to NBAF's success, and is provided opportunities to learn and grow.

3. Safety & Security. We hold ourselves accountable for the safety and security of each other, our environment, and our community.

We make safety and security a priority by:

a) Empowering each other to take responsibility: We ensure that our staff have a clear understanding of their roles, responsibilities, and performance expectations. By providing this clarity, we empower them to take full responsibility for their actions, particularly when it comes to safety and security. Each individual plays a crucial role in ensuring the well-being for themselves and everyone at NBAF.

b) Maintaining personal and situational awareness: Situational awareness is essential for effective decision-making in any potential work situation, especially in an environment like NBAF. We emphasize the importance of being aware of our surroundings and understanding the implications of decisions made. We also empower staff to pay attention to physical or emotional factors, which could directly impact the safety of themselves and others specific to the work they do. Situational-based decisions can have significant consequences for health, safety, and overall performance.

c) Understanding and following processes and procedures: Our policies and procedures serve as a guide for our day-to-day operations. They ensure compliance with laws and regulations, provide decision-making support, and streamline internal processes. By always following established processes, all members of the NBAF team understand their responsibilities and what is expected of them. This commitment enhances the quality of our science and operations, ultimately bolstering NBAF's reputation. Adherence to processes and procedures also minimizes workplace accidents and incidents, creating a safer and more comfortable work environment for all employees.

d) Speaking up when something doesn't look or feel right: As part of our HRO initiative, we actively promote a speak-up culture. We strive to transform our workplace into an environment where employees feel safe and confident to raise concerns, issues, and potential problems. We strongly encourage our staff to speak up, as this fosters the ideal culture at NBAF and helps mitigate potential threats. A robust, speak-up culture empowers employees to share their views and ideas, driving innovation and continual improvement.

Within NBAF, which is a highly complex facility with interrelated systems, the smallest problem has the potential to escalate or result in catastrophic consequences if left unaddressed. Rather than fostering an environment where employees are reluctant to raise concerns, NBAF leaders actively promote a speak-up culture that prioritizes accountability and problem prevention. At NBAF, staff are not punished for speaking up but may be reprimanded if they choose to suppress information or hide incidents that could prevent potential safety/security failures.

By upholding these principles, we create a culture of safety and security at NBAF, where every individual is committed to protecting themselves, their colleagues, and the broader community.





National Bio and Agro-Defense Facility

U.S. DEPARTMENT OF AGRICULTURE



Mission

To protect the United States against transboundary, emerging, and zoonotic diseases that threaten our food supply, agricultural economy, and public health.

Vision

A safer and more resilient America through a world-class science facility for large animal agricultural research, training, and diagnostics.

Core Values



Commitment to OneNBAF

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Excellence

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Safety & Security

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HIGH-RELIABILITY ORGANIZATION (HRO) FRAMEWORK



NBAF HRO Framework

A high-reliability organization (HRO) is an organization that is exceptionally consistent in accomplishing its goals and avoiding potential catastrophic errors despite operating in complex, high-risk, or hazardous environments.

For over half a century, scientists have safely worked in high-containment laboratories worldwide. Existing biosafety and biosecurity strategies effectively minimize known risks associated with high-containment laboratory work. However, in addition to these strategies, NBAF also focuses on residual risk factors, which are the risks associated with human error and behavior. These risks are less predictable, can change frequently, and require the active engagement of all staff members to maintain safety and security.

While complex systems can predict outcomes when sufficient information is available, it is human behavior that ultimately connects effective plans to desired outcomes. By implementing an HRO framework, potential problems are anticipated and addressed early enough to prevent catastrophic consequences.



We recognize that change is the difference between a lesson learned and a lesson ignored.

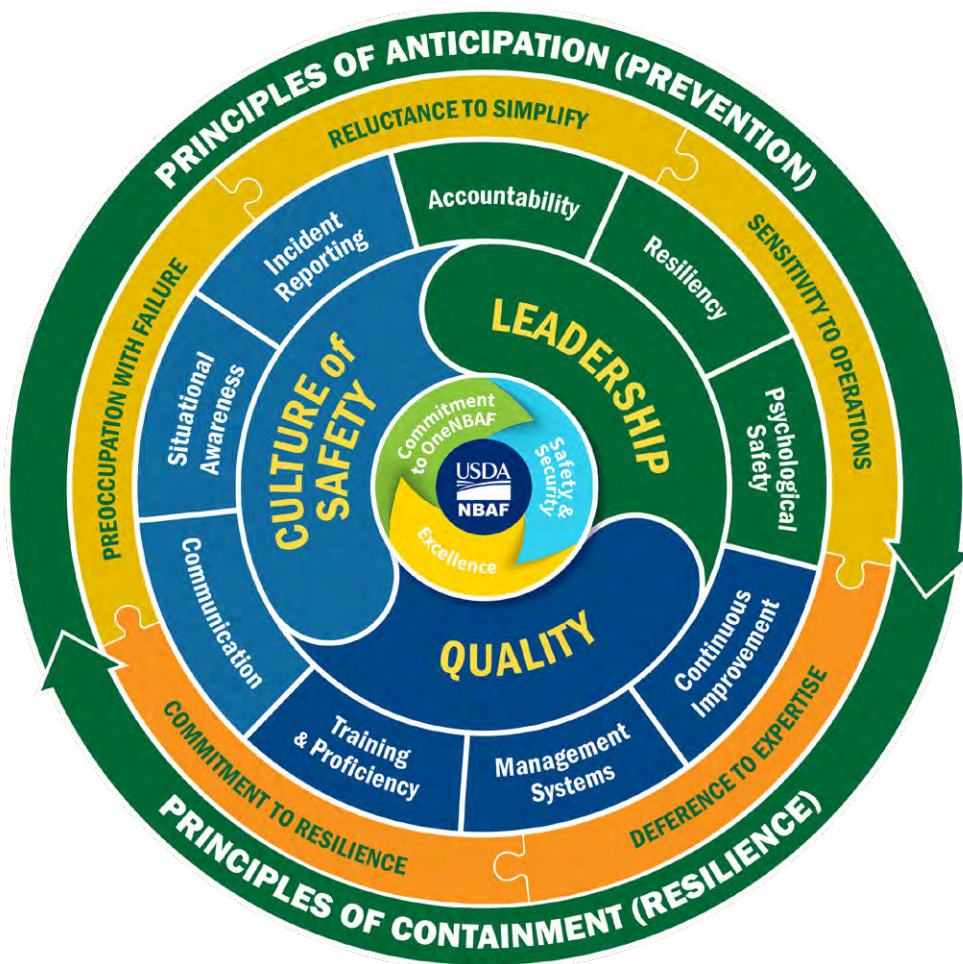


Figure 1: HRO Framework





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HRO PILLARS



NBAF HRO Pillars

Leadership, Quality, and Culture

NBAF is driven by a critical mission and guided by a set of core values that shape its employees' decisions and behaviors while striving to achieve their goals. With multiple complex interrelated systems in place, NBAF recognizes that risks associated with these systems are dynamic and constantly evolving.

To effectively manage and mitigate these risks, NBAF adopts a High-Reliability Organization (HRO) framework, which encompasses five essential principles. These principles are designed to foster excellence in outcomes, promote operational resiliency, and drive continuous improvement across all scientific and operational endeavors.

The HRO framework of NBAF is built upon three pillars:

Leadership

NBAF's leadership sets clear expectations and holds staff accountable. Leadership demonstrates a commitment to actions that enhance resiliency and ensure transparency both internally and externally. Reporting incidents, accidents, near-misses, failures and unexpected or odd scientific results to the highest levels of leadership within specified timeframes is an expectation, accompanied by strategies to prevent reoccurrence.

Quality

NBAF is committed to maintaining an effective and efficient quality management system. Continuous improvement is embedded in processes throughout the organization. Leaders prioritize comprehensive staff training and proficiency, implement robust systems to ensure quality, and promptly address issues to identify a root cause and take appropriate actions.

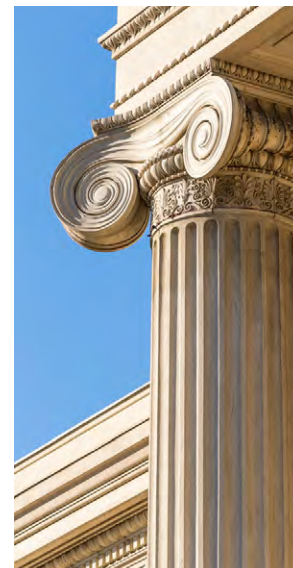
Culture of Safety

NBAF fosters a culture that is mission-aware, dedicated to the organization's vision, and grounded in its core values. It promotes open communication, accountability, and a psychologically safe environment where all staff members feel empowered to voice concerns without fear of reprisal or disparagement. NBAF encourages the highest levels of situational awareness, encompassing environmental factors as well as interpersonal and intrapersonal reflections. Retaliation and punishment against staff members who report workplace safety, security, or operational issues is strictly prohibited and not tolerated. The NBAF culture of safety seeks to overcome aspects of the traditional high-containment laboratory culture that have historically detracted from quality, safety and reliability: rigid hierarchy; units or sections that operate in silos; and assignment of blame and shame when errors occur.

By adhering to these HRO pillars, NBAF aims to ensure the effective management of risks associated with its complex systems, fostering a culture of excellence, resiliency, and continuous improvement.

The result is highly reliable and effective teams with significant insight, interdependency, and shared values.

An HRO culture focuses the entire organization on laboratory safety, consistency over time and personnel changes. But to err is human, and the complexities inherent to high-containment laboratories guarantee that unexpected challenges will arise. Continuous performance measurement and metrics is necessary to provide the opportunity to both detect and correct variation and to ensure continuous improvement and long-term resiliency.



NBAF has a critical mission and core values which drive the organization to achieve its mission, reach its goals and guide decisions and behaviors.



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HRO PRINCIPLES



NBAF HRO Principles

As a high-reliability organization, NBAF is creating an environment in which potential problems are anticipated, detected early, and responded to early enough to prevent catastrophic consequences. At NBAF, we pledge to cultivate resilience by relentlessly prioritizing safety over other performance pressures. NBAF is fully committed to establishing and operating within an HRO Framework. This framework is supported by five distinct ways of thinking that contribute to building, thriving, and sustaining a healthy organizational culture. These fundamental principles include the three principles of **anticipation** (Preoccupation with Failure, Reluctance to Simplify, Sensitivity to Operations) and two principles of **containment** (Commitment to Resilience, Deference to Expertise).

Anticipation focuses on preventing unexpected disruptive events and recognizing that such events can still occur despite efforts to identify weak signals and monitor operations. Therefore, attention shifts to containment, relying on resilient capabilities and appropriate expertise to limit undesirable outcomes when incidents occur.

1. We are preoccupied with failure.

At NBAF, we promote behaviors that actively seek out errors and potential problems among our employees. Our organization encourages open discussions between staff members and leadership regarding potential issues. Additionally, we expect all incidents, accidents, and near misses to be promptly reported.

We also value and recognize “good catches” within our organization. This approach emphasizes taking proactive measures to prevent incidents, accidents, or near misses before they occur. Even small mistakes are treated as potential indicators of underlying system issues that could have serious consequences if multiple errors align. NBAF maintains a “punishment-free” work environment and fosters a high level of transparency between leadership and staff.

2. We are reluctant to simplify.

At NBAF, we embrace the complexity of our work, understanding that it is both dynamic and intricate. While we acknowledge the benefits of standardizing workflows to minimize variations, we also recognize the intricate nature of our daily operations, involving numerous teams, processes, and relationships. Therefore, NBAF takes deliberate steps to gain a comprehensive understanding of the entire picture. We believe that a simple answer to a complex problem may indicate an incomplete understanding of the underlying issues.

At NBAF, we place significant importance on addressing failures. We understand that failures rarely stem from a single cause. Following all incidents, we conduct a root cause analysis (RCA) that focuses on understanding what went wrong rather than assigning blame. This analysis helps us identify the complex factors that contributed to the failure. We firmly believe that change is the key to transforming a lesson learned into meaningful action. Once an RCA is complete, we ensure that observable changes are made, confirming that the lessons have been truly internalized.

We actively challenge traditional beliefs like “We have always done it that way,” recognizing they do not serve as the sole basis for our scientific, safety, and security practices at NBAF. Instead, we are committed to constantly seeking ‘gold-standard’ science, safety, and security practices. We actively engage with external perspectives and embrace a continuous improvement process.



We are committed to constantly seeking ‘gold-standard’ science, safety, and security practices. We actively engage with external perspectives and embrace a continuous improvement process.



NBAF consists of numerous complex systems that require extensive collaboration and knowledge to operate.

3. We are sensitive to operations.

At NBAF, our team is not only interested in knowing how things are supposed to work, but also how they actually work. We understand the complexities of our operations and strive to maintain a high level of awareness regarding operational conditions. We place significant value on the front line, where the high-risk work is carried out. Having leadership present on the frontlines is an invaluable investment that yields significant returns.

To foster engagement and continuous improvement in workplace practices and workflows, leaders, managers, and frontline staff at NBAF actively participate in weekly walks, known as NBAF Leadership Rounds. During these walks, leaders and managers interact with frontline staff to identify opportunities for enhancement. Additionally, we have implemented a personnel reliability program (PRP) that encourages staff members to self-identify and “opt-out” if they are unable to perform their assigned duties.

At NBAF, we promote a culture of watchful awareness where employees are encouraged to identify and report colleagues who may be facing difficulties that hinder their job performance. We provide various channels for employees to ask questions, provide comments, share ideas, and report failures, problems, issues, or abuses of authority anonymously. All incidents, accidents, and near misses are promptly reported to the NBAF Director and senior leadership within 24 hours through incident management software.

4. We are committed to building resilience in our staff and operations.

At NBAF, we are dedicated to establishing resilience within our staff and operations. Our commitment to resilience means developing the capabilities to anticipate, detect, contain, and recover from the inevitable errors that occur in an unpredictable world. Instead of striving for an error-free environment, we focus on ensuring errors do not disable our safety culture. Resilience is achieved by minimizing the impact of errors and implementing innovative workarounds that allow our systems to continue functioning.

NBAF consists of numerous complex systems that require extensive collaboration and knowledge to operate. These systems become even more intricate when faced with unexpected challenges. Therefore, we devote ourselves to building adaptable systems that enable us to effectively respond to incidents, accidents, near-misses, failures, and disruptions that place additional stress on our resources and personnel.

On an annual basis, our staff actively participate in “stretch” exercises designed to enhance readiness and problem-solving capabilities in less-than-optimal circumstances. These exercises involve what-if scenarios that encourage staff to think critically and develop high levels of competency in emergency response procedures.

Furthermore, we conduct exercises that promote trust and strengthen informal relationships across the organization. These relationships prove invaluable when unexpected challenges arise, and innovative solutions are needed. Lastly, NBAF aims to learn from every unexpected challenge, either by preventing its recurrence or by being prepared to respond quickly and effectively should it reoccur.

5. We defer to expertise.

At NBAF, we highly respect the knowledge and experience of our frontline staff. We believe those who are directly involved in the work possess valuable insights and expertise. It’s important to note that expertise can come from individuals who may not hold leadership or managerial positions but have a deep understanding of specific issues.

We foster an environment where frontline staff and leadership are encouraged to openly discuss ideas and address concerns. Rather than relying solely on a hierarchical structure, our focus is on improving efficiency, safety, and security by discovering and understanding processes. We aim to break down any potential barriers that may arise from strict hierarchies and information silos.



We expect everyone at NBAF to actively share their concerns with others. Our organizational climate promotes open dialogue, ensuring all staff members feel comfortable raising potential safety problems.

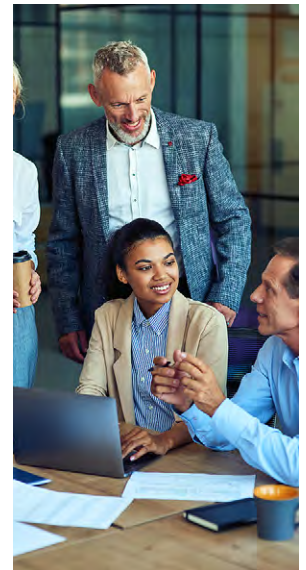
By embracing expertise and promoting open communication, we strive to create a collaborative and safe work environment.

As an attempt to blend the NBAF Core Values and HRO principles, all employees at NBAF agree to:

1. Prepare by saying and demonstrating what is expected before working independently.
2. Protect themselves and others by following and ensuring others follow standard operating procedures (SOPs).
3. Promote the immediate reporting of incidents, accidents, near misses, and failures.
4. Pause if anyone feels uncomfortable or encounters unidentified/unexpected risks during work.
5. Practice the NBAF core values by maintaining the highest levels of interpersonal, intrapersonal, and situational awareness in all they do.

At NBAF, it is expected that we actively encourage open communication and foster a culture of psychological safety. This means creating an environment where all team members feel comfortable discussing any concerns related to safety, security, or failures they may have or identify.

The NBAF team aims to be a dynamic and engaged group of partners and collaborators, actively contributing to the animal health and agro-defense research field. We strive to establish ourselves as an indispensable presence in this important domain.



We recognize that staff with the greatest knowledge about a specific issue might not be leaders or managers who have the highest level of authority.



Figure 2: Five Principles to Promote Organizational Safety





National Bio and Agro-Defense Facility
U.S. DEPARTMENT OF AGRICULTURE

To protect the United States against transboundary, emerging and zoonotic diseases that threaten our food supply, agricultural economy and public health.

HRO STRATEGIC OBJECTIVES



Science knows no country, because knowledge belongs to humanity, and is the torch which illuminates the world. — Louis Pasteur

NBAF HRO Strategic Objectives

Under an HRO framework, our unwavering dedication to the core values of NBAF has led to the development of the following six strategic objectives. Over the course of the next five years, these objectives will serve as a compass for all NBAF staff members, guiding their efforts toward fulfilling our mission.

Figure 3: HRO Strategic Objectives



These strategic objectives hold significant importance as they assist our staff in establishing and enhancing policies, procedures, and priorities to attain exemplary levels of safety and security in all aspects of our operations. In a complex laboratory landscape, different units/sections and individuals may have divergent priorities. The following strategic objectives serve as a unifying force, aligning efforts across NBAF toward common goals. This alignment ensures that everyone is pulling in the same direction, maximizing efficiency and effectiveness.

As we continue developing these strategic objectives, we will develop specific metrics and provide quantifiable targets against which performance can be measured. This will allow NBAF to assess the progress, identify areas for improvement, and make data-driven decisions to course-correct if necessary.

The strategic objectives indicated below are not mere aspirations; they are the guiding stars that illuminate our path to become an HRO.

- 1. Continually foster leadership capabilities and psychological safety.**
- 2. Promote excellence in communication.**
- 3. Promote situational and personal awareness.**
- 4. Facilitate reporting and response to incidents, accidents, near misses, and equipment failures.**
- 5. Establish training and proficiency requirements.**
- 6. Implement a systems management approach centered on a continuous quality improvement process.**



NBAF leadership is committed to the safety and health of employees, the public, and the environment, including U.S. agriculture.





We hold ourselves accountable and are empowered to take responsibility for the safety and security of ourselves and those we work with.

In today's rapidly changing scientific environment, high-containment laboratories must be able to pivot quickly in response to new challenges. The above strategic objectives provide a framework for decision-making, enabling NBAF to prioritize initiatives that are in line with our long-term goals while remaining flexible enough to adjust our tactics as circumstances evolve.

By setting these ambitious yet achievable goals, NBAF can inspire creativity and initiative among our teams. These strategic objectives challenge individuals and teams to push the boundaries, explore new ideas, and innovate solutions that propel NBAF forward.

Together, we cultivate a culture at NBAF that promotes open dialogue between leadership and staff. We empower staff to express their thoughts freely and encourage respectful disagreement.

Strategic Objective 1

Continually foster leadership capabilities and psychological safety.

Leadership is a multifaceted concept that encompasses several key components, including accountability, resiliency, transparency, and psychological safety.

It is crucial for leaders to take ownership of their decisions and actions, as well as hold themselves and their team members responsible and accountable for their performance. By fostering a culture of accountability, transparency & psychological safety, leaders can drive results and build trust. In HROs, decisions often need to be made quickly and under uncertain conditions. Strong leadership provides guidance and empowers employees to make informed decisions aligned with the organization's goals and values.

Resiliency is another essential trait for leaders, as it involves the ability to adapt to change, overcome challenges, and bounce back from failures. Resilient leaders inspire perseverance and continuous improvement within their teams by remaining composed under pressure and maintaining a positive attitude. HROs operate in complex and dynamic environments where unexpected events are inevitable. Leadership is essential for promoting resilience by fostering adaptive behaviors, encouraging learning from failures, and maintaining focus on long-term goals amid short-term challenges.

Transparency is vital for leadership and psychological safety in an organization. Open communication and decision-making processes build trust and engagement among employees. Transparent leaders inspire credibility, prevent misinformation, and foster a culture of honesty and collaboration. This creates a positive work environment where employees feel valued, motivated, and empowered to contribute their best.

Effective leadership ensures that safety and reliability are top priorities throughout NBAF. Psychological safety is a critical component of the OneNBAF culture, one in which ideas and concerns, questions, and the admission of mistakes occur regularly, without fear of negative consequences. This is essential at NBAF as it involves creating an environment where staff members feel comfortable expressing themselves, openly disagreeing with one another, and discussing concerns without the fear of negative consequences or punishment. The level of psychological safety can be measured by the gap between what staff members can and cannot say,

ask, or report. By fostering psychological safety, leaders encourage staff to report mistakes, provide honest feedback, and express differing opinions to leadership.

Leaders shape the organizational culture in HROs, setting the tone for how employees interact, collaborate, and approach their work. A strong culture of accountability, resiliency, and communication is essential for sustaining high performance and safety standards. Leadership that values and respects employees' contributions fosters higher levels of engagement and morale. This, in turn, leads to increased commitment to OneNBAF, improved teamwork, and better overall performance.

To ensure psychological safety for all NBAF staff, clear expectations are established throughout the organization. We prioritize the safety and quality of work over speed and quantity. Leaders strictly adhere to a policy of no shaming, blaming, or punishing when incidents, accidents, or near misses are reported. In the event of any issues, leaders and staff work collaboratively to identify root causes and view failures as opportunities for organizational improvement. All NBAF staff are encouraged, empowered, and provided with training to report problems and engage in difficult conversations. They feel supported and comfortable asking for help whenever needed. Together, leaders actively minimize competition among staff to ensure that no one feels undermined. Our goal is to ensure that every NBAF staff member feels valued and recognized for their unique skills and talents.

Strategic Objective 1 | Action Items

Continually foster leadership capabilities and psychological safety.

Action Items	
1.AI.1	Enhance and use leadership skills of accountability and resilience, which are critical to the NBAF culture of safety and security, by completing the HRO Training Program.
1.AI.2	Develop and disseminate a comprehensive set of organizational expectations that prioritize safety, quality of work, and open communication over speed and quantity.
1.AI.3	Measure and monitor the level of psychological safety within the organization by evaluating the gap between what staff members feel comfortable expressing and what they feel they cannot say, ask, or report.
1.AI.4	Create opportunities for staff to freely express their thoughts, share ideas, and discuss concerns with leadership in a respectful and constructive manner.
1.AI.5	Offer training programs that empower staff members to report problems, engage in difficult conversations, and provide honest feedback in a constructive manner.



Together, we watch out for ourselves and each other. We value the expertise of our staff and realize the importance of leadership communicating, observing, and learning from those working on the frontline.



NBAF is committed to obtaining the highest levels of internal and external transparency.

Strategic Objective 2

Promote excellence in communication.

Achieving excellence in communication for NBAF requires a strategic and holistic approach that encompasses various crucial aspects. This includes developing a clear communication strategy aligned with NBAF's goals, core values, and key mission.

Effective leadership communication is essential, with leaders consistently sharing the vision, core values, and mission while being open to feedback. Employee engagement is vital, achieved through regular communication, feedback mechanisms, and opportunities for two-way communication. Ensuring consistent messaging across all communication channels helps build trust and credibility. Tailoring communication messages and utilizing channels to address specific audiences while having a robust crisis communication plan are also crucial.

Providing training and development opportunities for employees to enhance their communication skills, seeking feedback for continuous evaluation and improvement, and staying current with communication trends and technologies are essential practices. By following these principles and practices, NBAF can foster a culture of excellence in communication, leading to improved employee engagement, stronger stakeholder relationships, and overall organizational success.

Clear and concise communication ensures that all team members are aligned with the organization's goals, strategies, and expectations, leading to improved decision-making and a more cohesive work environment. Additionally, strong communication skills foster trust, transparency, and accountability among employees, enabling smoother conflict resolution, enhanced teamwork, and ultimately, higher levels of employee engagement and job satisfaction. At NBAF, excellence in communication is not just a valuable asset but a critical necessity for seeking safety, security, and mission success.

Clear and effective communication is essential for maintaining safety in HROs. It ensures that critical information related to potential hazards, risks, and safety procedures is conveyed accurately and promptly to all relevant personnel, enabling them to take appropriate actions to mitigate risks and prevent accidents. HROs often involve complex and interdependent operations where multiple teams need to coordinate their activities seamlessly. Effective communication facilitates this coordination by ensuring that everyone understands their roles, responsibilities, and the broader objectives of the organization. When unexpected events or challenges arise, effective communication is essential for identifying and resolving issues quickly and efficiently. It enables teams to share information, brainstorm solutions, and collaborate effectively to address problems before they escalate into larger issues.

At NBAF, excellence in communication will be achieved by focusing on three key elements:

- **Clarity.** Clear communication is essential for effective organizational communication. It involves conveying messages in a straightforward and understandable manner to avoid any confusion or misinterpretation. This includes using simple language, providing context when necessary, and ensuring that the message is relevant to the audience.
- **Consistency.** Consistency in communication helps build trust and credibility within an organization. It involves ensuring that messages are aligned across different channels and that there is coherence in the information being shared. Consistent communication helps to reinforce key messages and NBAF values.

- **Feedback.** Feedback is crucial for improving communication within NBAF. Encouraging open feedback from employees, listening actively to their input, and responding constructively helps create a culture of continuous improvement. Feedback also allows NBAF to address any misunderstandings or issues that may arise in communication processes.

By focusing on clarity, consistency, and feedback, organizations can enhance their communication practices and promote a more effective and efficient work environment.

Strategic Objective 2 | Action Items

Promote excellence in communication.

Action Items	
2.AI.1	Align the communication strategy with NBAF's goals, core values, and mission to ensure consistency and clarity in messaging.
2.AI.2	Customize communication messages to address specific audiences within NBAF, considering their needs, preferences, and understanding levels.
2.AI.3	Offer training programs and resources to help employees enhance their communication skills and adapt to evolving communication trends and technologies.
2.AI.4	Encourage open feedback from employees to identify communication gaps, address issues promptly, and continuously refine communication practices.
2.AI.5	Promote a communication-centric culture within NBAF by emphasizing the importance of clarity, consistency, and feedback in all communication processes, ultimately driving organizational success and employee engagement.



NBAF is committed to ensuring that each employee has a voice and that all voices are heard and responded to in a timely manner.



NBAF staff must feel safe to speak up, disagree openly with one another, and discuss concerns without the fear of punishment or negative repercussions.

Strategic Objective 3

Promote situational and personal awareness.

In today's world, one of the most significant risks we face as human beings is our inability to be fully present and aware of our own emotions, interactions with others, and the environment around us. One of our primary objectives as part of being an HRO is to enhance staff awareness, both internally and externally, enabling us to swiftly identify, report, and address any anomalies in interpersonal dynamics, individual well-being, and the work environment.

Intrapersonal Awareness equips our staff to recognize when they may be unable or unfit to perform their duties due to internal factors. Staff members who are distracted, fatigued, unwell, or facing personal challenges are more prone to making mistakes that could jeopardize their own safety or the safety of others.

Interpersonal Awareness fosters healthy working relationships through effective communication and behavior. NBAF staff are encouraged to be mindful of how their words and actions impact their colleagues. They must possess the ability to prevent, address, and manage conflicts constructively.

Situational Awareness encompasses the ability to identify abnormal sounds, malfunctioning equipment, unusual smells, misplaced items, and other potential risks or signs of facility dysfunction. At NBAF, we urge our staff to engage all senses upon entering the workspace, proactively identifying any potential hazards in the environment.

Collectively, we strive to cultivate a heightened state of awareness among NBAF staff. By being mindful of the work environment, fostering positive relationships with colleagues, and staying attuned to their own well-being, staff members can effectively minimize risks.

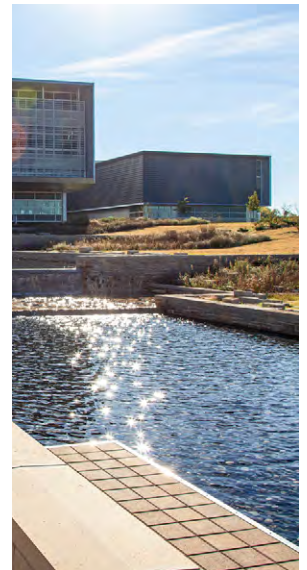
We prioritize self-awareness, awareness of others, and awareness of the work environment to create a safe and productive NBAF community.

An HRO demonstrates a heightened level of awareness. It places importance on factors such as acknowledging potential failures, building resilience among staff, and fostering sensitivity towards operational aspects. At NBAF, we prioritize empowering our staff to actively voice their concerns and observations, reliably identify and address conflicts as they arise, and take necessary breaks, be it physical, emotional, or mental, whenever required.

Strategic Objective 3 | Action Items

Promote situational and personal awareness.

Action Items	
3.AI.1	Implement regular mindfulness training sessions to help staff members develop intrapersonal awareness and the ability to recognize their own emotions, stressors, and limitations.
3.AI.2	Conduct workshops on conflict resolution techniques to enhance interpersonal awareness and equip staff with the skills to effectively address and manage conflicts in a constructive manner.
3.AI.3	Establish open communication channels, such as suggestion boxes or anonymous feedback mechanisms, to encourage staff to report concerns related to safety, well-being, or environmental risks.
3.AI.4	Organize regular safety walks where staff members are encouraged to actively observe their surroundings, identify potential hazards or anomalies, and report any issues promptly.
3.AI.5	Develop a clear reporting system for staff to report anomalies in interpersonal dynamics, individual well-being, or the work environment.



Together, we foster a culture within NBAF which promotes open dialogue between leadership and staff.





Together we strive for the highest level of staff proficiency to minimize and control residual risk in the workplace.

Strategic Objective 4

Facilitate reporting and response to incidents, accidents, near misses, and equipment failures.

Capturing unanticipated events such as incidents, accidents, failures, and near misses poses a significant challenge within organizations. Various barriers hinder both the reporting and learning process associated with these events. Failing to learn from these occurrences represents a missed opportunity to enhance safety and security across NBAF.

To address this challenge, NBAF leadership actively identifies and tackles barriers that impede staff from reporting unexpected events. It is expected that immediately following such an event, staff will report it (verbally) and formally document the incident (in writing) to their supervisors. Supervisors, in turn, are responsible for promptly informing the NBAF Senior Leadership Group (SLG) about the event and presenting a plan to minimize the likelihood of its recurrence within 24 hours.

Furthermore, NBAF invests in training its staff on incident investigation and provides them with a well-defined approach, known as root cause analysis (RCA), to ensure that unexpected events are not oversimplified and valuable improvement insights are not overlooked.

Collectively, we prioritize the immediate logging and reporting of all incidents, accidents, failures, and near misses. We actively devise solutions to mitigate the chances of a repetition. Our commitment extends to conducting thorough incident investigations and employing RCA methodologies. We understand the true difference between learning a lesson and disregarding it lies in our ability to embrace change. At NBAF, change signifies progress and continual improvement.

We meticulously document and analyze all incidents, accidents, failures, and near misses to identify opportunities for continuous improvement.

In an HRO, learning from failures is paramount. It is crucial not to oversimplify the reasons behind a failure. At NBAF, we conduct thorough investigations to identify the root causes of all failures. By implementing changes and embracing the lessons learned, we enhance our resilience and strive for continuous improvement. We view failure as an opportunity to grow and excel.

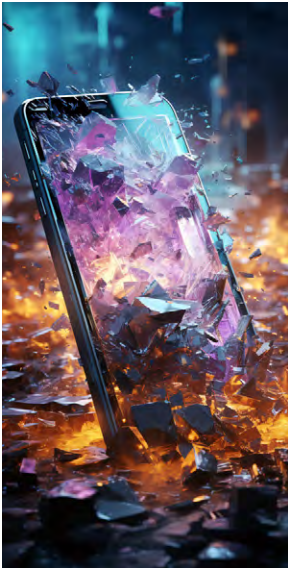
Strategic Objective 4 | Action Items

Facilitate reporting and response to incidents, accidents, near misses, and equipment failures.

Action Items	
4.AI.1	Encourage staff to report incidents without fear of reprisal and highlight the role reporting plays in enhancing safety and security.
4.AI.2	Offer comprehensive training on incident investigation techniques to all staff members.
4.AI.3	Implement a user-friendly incident reporting system that allows staff to easily log incidents, accidents, failures, and near misses.
4.AI.4	Educate supervisors on the importance of prompt reporting and escalation of incidents to senior leadership.
4.AI.5	Establish a regular review process for incident data to identify trends, patterns, and recurring issues.



A proficient staff is a resilient staff. At NBAF, we not only ensure staff are proficient in what is expected from them on a day-to-day basis, but we also ensure proficiency specific to emergency response.



Together, we strive to immediately log and report all incidents, accidents, failures, and near misses.

Strategic Objective 5

Establish training and proficiency requirements.

At NBAF, we recognize that inherent risks are present in everything we do. To manage these risks, we have implemented a comprehensive process of identification, assessment, and strategic management. However, despite our efforts to control identified risks, it is important to acknowledge that we cannot guarantee a completely risk-free work environment. Residual risks, which primarily stem from human factors, can be effectively managed by ensuring that our staff members receive adequate training, demonstrate proficiency, and undergo regular evaluations to ensure their cognitive and behavioral fitness for duty.

Our workplace is governed by Standard Operating Procedures (SOPs) that are specifically designed to address the inherent risks we encounter. However, the successful implementation of these SOPs relies on the willingness and ability of our staff members, which presents a residual risk. Therefore, all SOPs at NBAF undergo thorough evaluation and validation. Staff members are then assessed both cognitively and behaviorally to verify their proficiency. Only when they can confidently “SAY IT & DO IT” are they deemed proficient in their specific responsibilities. We assess staff proficiency upon their initial employment at NBAF and annually for returning staff, ensuring that fitness for duty remains a constant control for residual risk factors.

The proficiency of our staff members is crucial in determining their readiness to work at NBAF. A proficient staff is a resilient staff. We not only ensure that our staff members are proficient in their day-to-day tasks but also in emergency response procedures. As part of this commitment, staff members are expected to regularly participate in exercises that evaluate their cognitive and behavioral reactions to unforeseen events. This sustains a heightened level of awareness and mindfulness among all NBAF staff.

Together, we strive to achieve the highest level of staff proficiency to minimize and control residual risks in the workplace. We ensure that new staff members achieve the required proficiency before they are allowed to work, and we combat complacency by conducting regular audits of proficiency among existing staff.

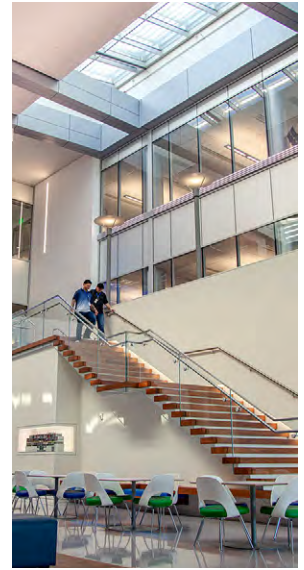
At NBAF, we set training and proficiency requirements to ensure the competence of our staff members.

An HRO sets performance expectations for all staff members. By implementing consistent practices, we strive to achieve quality and resiliency. When there is a heightened awareness of our operational processes and adherence to our plans and procedures, we can minimize failures.

Strategic Objective 5 | Action Items

Establish training and proficiency requirements.

Action Items	
5.AI.1	Develop a comprehensive training program that covers not only day-to-day tasks but also emergency response procedures to enhance staff proficiency.
5.AI.2	Conduct regular assessments of staff members' cognitive and behavioral fitness for duty to identify any gaps in proficiency.
5.AI.3	Offer continuous training opportunities to staff members to enhance their skills and knowledge in risk management and safety procedures.
5.AI.4	Create a culture of accountability where staff members are encouraged to "SAY IT & DO IT" to demonstrate their proficiency in following SOPs.
5.AI.5	Continuously monitor and adjust training and proficiency requirements based on evolving risks and industry best practices to ensure staff readiness and resilience.



An HRO learns from its failures. The biggest mistake we can make following a failure is to simplify the reasons for why the failure occurred.



At NBAF, we must establish principles which ensure success in avoiding safety and security catastrophes in a complex environment where normal accidents can be expected.

Strategic Objective 6

Implement a systems management approach centered on a continuous quality improvement process.

NBAF is dedicated to upholding the highest standards of quality and excellence in all facets of our operations. Our unwavering commitment to quality drives us to continuously strive for improvement and overcome challenges swiftly and effectively. To ensure consistency and ongoing enhancement, we have integrated the “Plan, Do, Check, Act” model and incorporated Lean Six Sigma components into our daily operations. By emphasizing data collection and analysis, we proactively identify and mitigate risks, ensuring the highest level of quality and reliability in our work. Our leaders are attuned to the intricacies of our operations and readily provide additional resources and support to address challenges faced by units or staff. This resilience is fundamental to NBAF’s mission, and we continuously strive to identify, manage, and mitigate threats to our operations.

At NBAF, we cultivate a culture of continuous improvement that promotes the highest levels of quality and resiliency. Through active engagement with quality assurance models, we enhance consistency and fortify our ability to withstand challenges. Our steadfast commitment to quality and resiliency is essential in fulfilling NBAF’s critical mission of safeguarding public and animal health in the United States. Establishing and implementing a systems approach is imperative to prevent safety and security catastrophes in our complex operational environment. Key elements of this approach include overall governance, strategic planning, reporting processes, policies, values, and fostering a strong organizational culture.

NBAF adopts a systematic approach to assess, control, and evaluate risks inherent in our day-to-day operations. Operating as a high-reliability organization (HRO) requires a thorough understanding of nonconformities and incidents, with systematic identification and correction to enhance overall performance. Senior leadership, unit leads, and supervisors play a crucial role in ensuring NBAF team members have the necessary resources, clear communication of policies, well-defined performance expectations, and prompt resolution of incidents and nonconformities. Opportunities for improvement are regularly identified and pursued to drive ongoing enhancements throughout the organization.

NBAF’s systems approach as an HRO places strong emphasis on continuous improvement for individuals and processes within the organization. The management system evaluates itself against risk criteria, identifying areas for enhancement through ongoing reviews of all processes. Preventive activities and corrective actions are promoted to mitigate safety and security risks. Comprehensive emergency response training is provided to staff members to ensure resilience, effective mitigation, and swift recovery in case of any incidents.

We embrace a process of continuous improvement to ensure quality and resiliency remain at the forefront of our operations. By implementing a systems management approach, NBAF fulfills its legal requirements and actively supports its operation as an HRO.

High-Reliability Organizations (HROs) implement a comprehensive systems management approach that includes key elements like strong leadership commitment, well-defined risk management plans, and provision of necessary resources for successful operations. HROs ensure operational success through regular performance evaluations and emergency response exercises to enhance resiliency and drive continuous improvement. By implementing robust data collection practices for quality assurance, HROs gain a heightened awareness of operations, enabling prompt recognition, response, and recovery from challenges. Quality assurance programs not only identify issues but also engage the right individuals to mitigate future problems, fostering continuous improvement and excellence.

Strategic Objective 6 | Action Items

Implement a systems management approach centered on a continuous quality improvement process.

Action Items	
6.AI.1	Conduct regular training sessions on Lean Six Sigma principles and methodologies for all staff members to increase proficiency in process improvement techniques and problem-solving skills.
6.AI.2	Implement a robust data collection and analysis system to track key performance indicators (KPIs) related to quality, safety, and operational efficiency, allowing for real-time monitoring and proactive decision-making.
6.AI.3	Establish a mentorship program where experienced leaders provide guidance and support to junior staff members, facilitating knowledge sharing, skill development, and succession planning within the organization.
6.AI.4	Invest in technology solutions such as quality management software, incident reporting systems, and communication tools to streamline processes, enhance data visibility, and facilitate collaboration across departments for faster problem resolution.
6.AI.5	Conduct periodic risk assessments and audits to identify potential vulnerabilities in operations, prioritize risk mitigation strategies, and enhance overall resilience against potential threats.



HROs ensure success of operations through performance evaluations and emergency response exercises which provide opportunities for continual improvement.



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