PNNL-SA-107041

Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by Battelle *Since 1965*

A Performance-Based Approach to Export Control Regulations

Rewarding Companies for Exceptional Compliance Behavior While Improving the Efficiency of Export Control Licensing

December 2014

M Quint
R Weise
G Hund

U.S. DEPARTMENT OF ENERGY

Prepared for the U.S. Department of Energy
under Contract **DE-AC05-76RL01830**

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor Battelle Memorial Institute, nor any of their employees, makes **any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights**. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or Battelle Memorial Institute. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

Available to DOE and DOE contractors from the
Office of Scientific and Technical Information,
P.O. Box 62, Oak Ridge, TN 37831-0062;
ph: (865) 576-8401
fax: (865) 576-5728
email: reports@adonis.osti.gov

Available to the public from the National Technical Information Service
5301 Shawnee Rd., Alexandria, VA 22312
ph: (800) 553-NTIS (6847)
email: orders@ntis.gov <http://www.ntis.gov/about/form.aspx>
Online ordering: http://www.ntis.gov

This document was printed on recycled paper.
(8/2010)

PNNL-SA-107041

A Performance-Based Approach to Export Control Regulations

M Quint G Hund
R Weise

December 2014

Prepared for
the U.S. Department of Energy
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory
Richland, Washington 99352

Summary

In May 2014, the Pacific Northwest National Laboratory (PNNL) hosted a seminar in Seattle, Washington, on Enhancing Industry-Government Cooperation in Nuclear Export Control. The event demonstrated a shared desire for new export control approaches that encourage exceptional compliance behavior while improving regulatory efficiency. To build upon these themes, the National Nuclear Security Administration (NNSA) tasked PNNL to investigate regulatory examples outside the export control domain that might encourage regulated entities to exhibit exceptional compliance behavior while reducing inefficiencies in the regulatory process.

Since 1993, U.S. presidential guidance has consistently called for the use of performance-based regulations, where possible.[1] In Executive Order 13563, President Obama reiterated the conclusions of President Clinton that "to the extent permitted by law, each agency must […] to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt."[2] Today, many U.S. Government agencies, including those described below, rely on some mix of prescriptive and performance-based regulatory approaches.

This paper examines three U.S. Government agencies that oversee companies and technologies that are the same as or similar to those involved in nuclear exports, namely the Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC) and the Department of Defense (DOD). PNNL found that each agency relies to some extent on performance-based approaches (PBAs) to encourage exceptional compliance with regulations while reducing inefficiencies in the regulatory process.

The data on PBA's cost-effectiveness and efficacy are mixed. Generally, agencies were unable to provide statistics validating PBAs' superiority to other regulatory approaches. However, there is circumstantial evidence that PBAs either are relatively cost-effective or efficient and maintain or improve compliance. Furthermore, from the high upfront costs and reorientation of internal processes for both regulators and industry one can infer that the decisions to use PBAs were not taken lightly.

Better data is needed to inform the consideration of PBAs for nuclear nonproliferation. If regulators' and companies' preference for PBAs is due to PBAs' efficiency or cost-effectiveness, there should be ample data to support their use. A follow-on study could investigate available datasets and, as feasible, describe the influence of performance-based regulation on cost-effectiveness and efficacy.

Applied to nuclear export controls, a performance-based approach might be described as focusing on the goal of nonproliferation while identifying some flexibility in the means by which companies control the goods and services along their supply chain. One step could be to consider integrating PBAs into Title 10 of the Code of Federal Regulations, Part 810, under which DOE regulates license applications for nuclear technology and assistance exports. While PBAs require further consideration, if validated they represent a potentially powerful approach to improving nonproliferation outcomes and enhancing the competitiveness of U.S. firms.

---

[1] Regulatory Planning and Review, Executive Order 12866, Section 1 (b), paragraph (8), Federal Register, Vol. 58, no. 190, October 4, 1993, http://www.archives.gov/federal-register/executive-orders/pdf/12866.pdf.

[2] Improving Regulation and Regulatory Review, Executive Order 13563, Section 1 (b), January 18, 2011, http://www.whitehouse.gov/the-press-office/2011/01/18/improving-regulation-and-regulatory-review-executive-order.

Contents

Summary iii
1.0 Introduction 2
2.0 Fundamentals of Regulatory Approaches 3
3.0 Examples of Performance-Based Regulations in the United States 4
3.1 Environmental Protection Agency 5
3.2 Nuclear Regulatory Commission 6
3.3 Department of Defense 7
4.0 Considering Performance-Based Export Control Regulations 8
5.0 Conclusion 13

1.0 Introduction

In May 2014, the Pacific Northwest National Laboratory (PNNL) hosted a seminar in Seattle, Washington, on Enhancing Industry-Government Cooperation in Nuclear Export Control. Industry and government representatives met to discuss and understand each other's perspectives on export control. The event demonstrated a shared desire for new export control approaches that encourage exceptional compliance behavior while improving regulatory efficiency. Observations from the event include:[3]

- Industry suggested that regulators tell companies the desired outcomes of export control compliance and nonproliferation, not the methods needed to be compliant
- Participants wondered what can be done to motivate companies to bring nonproliferation into their practices—how to motivate industry to want to do more than just meet their legal/regulatory requirements, potentially partnering with government
- Participants agreed that one-size-fits-all approaches may not be efficient or possible
- Industry suggested that regulators use a more risk-based approach to licensing; e.g., that it is inefficient to treat two exports equally if the commodities are going to a trusted country versus commodities going to a less-than-trusted country
- Both industry and government suggested considering whether there might be ways for companies to demonstrate exceptional compliance and therefore require less scrutiny
- Regulators raised the concern that they do not want export controls to become a "box-checking exercise" for compliance—they want companies to seriously consider nonproliferation issues
- Industry expressed concern over the export control difficulties faced by multinational companies that must apply for licenses when exporting within the company and its subsidiaries
- Industry suggested focusing on high-risk activities and minimizing effort and time spent on low-risk activities
- Industry suggested improved licensing predictability
- Participants agreed that two-way information-sharing and cooperation would greatly improve the application of export controls

In response to these observations, the National Nuclear Security Administration (NNSA) tasked PNNL to investigate regulatory examples outside the export control domain that might encourage regulated entities to exhibit exceptional compliance behavior while reducing inefficiencies in the regulatory process. This paper examines three U.S. Government agencies that oversee companies and technologies that are the same as or similar to those involved in nuclear exports, namely the Environmental Protection Agency (EPA), Nuclear Regulatory Commission (NRC) and the Department of Defense (DOD). PNNL found that each agency relied to some extent on performance-based approaches (PBAs) to encourage exceptional compliance with their respective regulations while reducing inefficiencies in the regulatory process. Based on these case studies, the paper then considers the potential viability of PBAs for nuclear nonproliferation and proposes next steps.

[3] "International Seminar on Enhancing Industry-Government Cooperation in Nuclear Export Control," Pacific Northwest National Laboratory, May 2014, Seattle, WA, PNNL-104640.

2.0 Fundamentals of Regulatory Approaches

A regulation is a "binding legal norm created by a state organ that intends to shape the conduct of individuals and firms."[4] Agencies can design regulations in several ways, and one method is known as "prescriptive" regulation. Prescriptive regulations require that a certain tool or method be used to solve a given problem.[5] They "prescribe" what must be done to reach a certain goal. In this way, prescriptive regulations are a one-size-fits-all problem-solving approach.

Performance-based approaches offer a way to reduce some of the inefficiencies posed by prescriptive approaches while potentially encouraging innovation and exceptional compliance behavior. Performance-based regulations require companies to achieve compliance, but do not mandate the manner in which companies do so—defined by one supporter as "thinking and working in terms of ends rather than means."[6]

The flexibility inherent in PBAs offers companies the option of developing innovative solutions that save them money while demonstrating exceptional efforts to meet the regulatory goal. In turn, government regulators can cite exceptional compliance efforts to justify exemptions from prescriptive regulatory processes. This concept is captured well by then-Director of the EPA's Performance Incentives Division in 2006: "Facilities with a strong compliance record, a sound EMS [Environmental Management System], community outreach, and demonstrated performance beyond what the law specifies do not require the same level of regulatory oversight as others."[7]

It is important to note that PBAs do not replace prescriptive regulations. Rather, this paper envisions a hybrid approach in which PBAs are used to *complement* prescriptive regulations for companies that demonstrate strong or exceptional compliance.[8] Companies that use PBAs to demonstrate exceptional regulatory compliance might receive regulatory benefits. Companies that elect not to participate in the PBA program or those that do not qualify, potentially due to their being "generally-compliant" or "less-than-compliant," would still be governed by the prevailing prescriptive system.

---

[4] Barak Orbach, "What is a Regulation?" Yale Journal on Regulation Online Vol. 30:1, 2012, 6, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2143385.

[5] Cary Coglianese et al., "Performance-Based Regulation: Prospects and Limitations in Health, Safety, and Environmental Protection," Regulatory Policy Program Report RPP-03, Harvard University, 2002, 8, http://www.hks.harvard.edu/m-rcbg/Events/Papers/RPPREPORT3.pdf.

[6] A participant of the PNNL seminar similarly suggested: "Government should not impose a solution, but [instead should] ask the right questions that prompt the company to figure out what is best for them." Additionally, see Greg Foliente, "Developments in Performance-Based Building Codes and Standards," *Forest Products Journal*, July/August 2000, Vol. 50, No. 7/8, 12.

[7] Cary Coglianese and Jennifer Nash, "Performance Track's Postmortem: Lessons Learned from the Rise and Fall of EPA's 'Flagship' Voluntary Program," Regulatory Policy Program Working Paper RPP-2014-12, Harvard University, 2014, http://www3.law.harvard.edu/journals/elr/files/2014/04/Coglianese__Nash_Print1.pdf. For export controls, "community outreach" could entail informing the public about export controls and nuclear nonproliferation, or discussing export controls within a company's "community" of suppliers and stakeholders, for example.

[8] Cary Coglianese et al., "Performance-Based Regulation," 2002, 8.

3.0 Examples of Performance-Based Regulations in the United States

Since 1993, U.S. Presidential guidance has consistently called for the use of performance-based regulations where possible.[9] In Executive Order 13563, President Obama reiterated the conclusions of President Clinton that "to the extent permitted by law, each agency must […] to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt."[10]

The examples of the Environmental Protection Agency, Nuclear Regulatory Commission, and Department of Defense described below are hybrid approaches that provide a basic illustration of PBAs in action. Across all three case studies—and the wider PBA discourse—a primary question is whether PBAs are in fact more effective than prescriptive alternatives.

This question has been under investigation for many years. In 2002, Harvard University hosted a workshop on the prospects and limitations of performance-based regulations.[11] Participants included multiple U.S. agencies that had implemented PBAs and agencies that might be expected to gather and assess PBA-related data.[12] According to the post-workshop report, "researchers have yet to subject performance-based standards to close empirical scrutiny. There has been relatively little study of how performance-based regulation works in practice across different regulatory settings."[13] This lack of data continues today, making it impossible to conclude empirically that PBAs can complement and improve prescriptive regulations.[14]

However, there is circumstantial evidence that PBAs are cost-effective, efficient, or both, and maintain or improve compliance. In each of the examples investigated below, industry voluntarily participates in performance-based regulations, suggesting they prefer it over alternatives. Both regulators and industry initially chose to use, and then continued using PBAs, rather than return to prescriptive methods. Due to high upfront costs of development and implementation for both regulators and industry, one can infer that the decisions to use PBAs were not taken lightly—they may have required executive-level buy-in from firms, which may have also required cost-benefit and regulatory analysis to support the investment. As the conveners of the Harvard PBA workshop argued: "participation in these programs is by definition voluntary, [and] businesses only incur additional costs when they perceive countervailing private benefits."[15] While there is almost no data to back-up claims that PBAs are an improvement over prescriptive regulations, their widespread use and buy-in demonstrates that PBAs are preferred over prescriptive regulations by both regulators and regulated entities.[16]

---

[9] Regulatory Planning and Review, Executive Order 12866, October 4, 1993.
[10] Improving Regulation and Regulatory Review, Executive Order 13563, January 18, 2011.
[11] Cary Coglianese et al., "Performance-Based Regulation," 2002, 8.
[12] Participating agencies included EPA, NRC, GAO, National Aeronautics and Space Administration, Occupational Safety and Health Administration, Department of Transportation, Office of Management and Budget, Federal Railroad Administration, National Fire Protection Association, Consumer Product Safety Commission, and National Transportation Systems Center.
[13] Ibid.
[14] Personal email to author from Dr. Cary Coglianese, University of Pennsylvania School of Law, November 13, 2014.
[15] Cary Coglianese and Jennifer Nash, "Performance Track's Postmortem," 2014.
[16] See Cary Coglianese et al., "Performance-Based Regulation," 2002: "Although several participants suggested that performance-based standards are probably preferable to design standards in the vast majority of situations, these and other participants recognized that there is little empirical evidence to support this claim. Indeed, it was generally

3.1 Environmental Protection Agency

The Environmental Protection Agency (EPA) is one of the leading supporters of PBAs and has implemented several performance-based programs over the past twenty years. Among them are Project XL (eXcellence and Leadership) and Performance Track. Project XL was one of EPA's first attempts at PBA and had a short lifespan with minimal participation.[17] Meanwhile, Performance Track lasted nearly ten years, included more than 780 facilities, and was defined by EPA as its "flagship program" prior to being disbanded in 2009 following both the arrival of a new EPA Administrator and in response to claims that EPA could not verify Performance Track's achievement of desired goals.[18] Performance Track has since been copied by several federal regulatory bodies, and "at least fifteen states still maintain environmental leadership programs nearly identical to Performance Track."[19]

Under Project XL, regulators provided facility operators the opportunity to propose novel approaches to pollution control in exchange for exemptions from specific regulatory requirements. Companies would be granted approval to participate in the program if they could demonstrate that their proposal would "produce superior environmental results beyond those that would have been achieved under current and reasonably anticipated future regulations or policies."[20]

Similarly, EPA believed that Performance Track would allow "inspectors to focus less attention on facilities identified as top performers and more attention on truly laggard facilities. By rewarding top performers and targeting laggards, EPA also sought to encourage more firms to strengthen their environmental practices."[21]

In July 2006, General Electric (GE) Silicones provided a progress report of its Project XL performance-based implementation.[22] Over ten years, the GE Silicones facility saved $11 million, reduced new waste generation by 24 million pounds, and implemented 164 new pollution prevention mechanisms.[23] An Intel semiconductor manufacturing plant also benefitted from Project XL through flexible permitting requirements.[24] In its 1999 report, the Intel facility had reduced emissions across the board by at least 75 percent, with some emissions categories being reduced by nearly 100 percent.[25] Additionally, Intel concluded that performance-based flexibility allowed it to get its products to market faster.[26]

---

acknowledged that there is a dearth of empirical studies aimed at measuring the effectiveness of performance-based standards, especially in comparison to the effectiveness of other regulatory instruments."

[17] Cary Coglianese and Jennifer Nash, "Performance Track's Postmortem," 2014.

[18] Ibid.

[19] Ibid.

[20] "What is Project XL?" Environmental Protection Agency, archive: last updated October 9, 2014, http://www.epa.gov/projectxl/file2.htm.

[21] Cary Coglianese and Jennifer Nash, "Performance Track's Postmortem," 2014.

[22] "Project XL: Eighth Annual Project Report," GE Silicones, LLC, Environmental Protection Agency (EPA), July 27, 2006, http://www.epa.gov/projectxl/crompton/GESiliconesJuly2006.pdf.

[23] Ibid., 8.

[24] "XL Project Progress Report," Intel Corporation, EPA, March 1999, 2, http://www.epa.gov/projectxl/intel/033199.pdf.

[25] Ibid., 7-11.

[26] Ibid., 3.

While several industrial facilities successfully implemented new approaches, Project XL ultimately failed for several reasons. One researcher argued that the project development process was too demanding and costly, meaning "Project XL [favored] large firms that [could] afford to pay significant project development costs."[27] Because of this, companies that generally completed such a rigorous process had significant resources,[28] potentially constraining the number of applicants.

In contrast, the data available for Performance Track shows hundreds of facilities performing exceptionally well prior to and during the program, but EPA did not compare them to a control group of facilities outside the program.[29] Therefore, EPA could not prove that Performance Track facilities performed better than non-participating facilities.[30] In fact, researchers found in the case of Performance Track that "what most distinguished participants was a factor distinct from environmental quality, namely their propensity to engage in outreach with government and community groups."[31]

Project XL and Performance Track demonstrate that the performance-based model can work in certain scenarios, but it is less clear what conditions are necessary for success or how widespread that success can be. Ultimately, it is telling that after multiple program iterations over two decades, EPA continues to use PBAs to complement baseline prescriptive regulations.[32]

3.2 Nuclear Regulatory Commission

The U.S. Nuclear Regulatory Commission (NRC) complements prescriptive reactor safety regulations with performance-based metrics.[33] The system, characterized by NRC as "risk-informed, performance-based,"[34] is voluntary; facilities can continue being regulated by the previous system, as some still do today.[35] NRC's use of PBAs is notable because NRC directly interacts with many of the major nuclear power and technology companies that might be interested in performance-based export controls.

NRC uses performance metrics to support safety assessments for reactor fires, core damage, radioactive release, and equipment failure, among others.[36] George Apostolakis, currently a Commissioner with NRC, presented in 2006 regarding NRC's PBAs. (At the time, Apostolakis was a professor at the Massachusetts Institute of Technology.[37]) He argued that the benefits of NRC's PBAs include better prioritization of risks, broader consideration of challenges, enhancement of reactor regulations, improved public safety,

---

[27] Allen Blackman and Janice Mazurek, "The Cost of Developing Site-Specific Environmental Regulations: Evidence from EPA's Project XL," *Resources for the Future*, March 2000, ii, http://www.rff.org/rff/Documents/RFF-DP-99-35-REV.pdf.
[28] Ibid.
[29] Cary Coglianese and Jennifer Nash, "Performance Track's Postmortem," 2014.
[30] Ibid.
[31] Ibid.
[32] Ibid.
[33] Nuclear Regulatory Commission, "Implementation and Update of the Risk-Informed and Performance-Based Plan," SECY-07-0191, October 31, 2007, http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2007/secy2007-0191/2007-0191scy.pdf.
[34] Ibid.
[35] Phone interview with Garill Coles, PNNL subject matter expert on NRC PBAs, October 17, 2014.
[36] NRC, Implementation and Update, 2007, Enclosure 1.
[37] George E. Apostolakis, "Risk-Informed Changes to the Licensing Basis," Elements of Reactor Design, Operations, and Safety, Massachusetts Institute of Technology (MIT), fall 2006, http://ocw.mit.edu/courses/nuclear-engineering/22-39-integration-of-reactor-design-operations-and-safety-fall-2006/lecture-notes/lec12_ga.pdf.

and, importantly, "a reduction of regulatory burden […] resulting in redirection of resources to areas of greater benefit."[38]

NRC concluded that PBAs "improve the effectiveness and efficiency of NRC's regulatory process, including improved safety and reduction of unnecessary regulatory burden."[39] Moreover, NRC points to nuclear power companies' voluntary adoption of PBAs as proof of industry support for performance-based regulation.[40] However, NRC has not published data to support these conclusions.[41]

NRC's assessment is consistent with an interview of a PNNL subject matter expert (SME) who stated that even though NRC's application procedure for performance-based regulation is expensive and time-consuming on the front-end, companies see it as financially beneficial and a reduction in regulatory burden in the long-run.[42] The PNNL SME also cited the voluntary implementation by many nuclear power operators as proof of their support for the approach.[43] The Government Accountability Office (GAO) agrees that NRC's PBAs provide "a number of benefits" to reduce safety risks.[44]

3.3 Department of Defense

For the past 20 years, the Department of Defense (DoD) has used performance-based logistics (PBL) to ensure operational readiness of select weapons systems.[45] DoD's system, as with EPA and NRC, is a hybrid: In 2001, DoD identified PBL as its *preferred* weapons system support option, but contractors are not required to use it.[46] An analysis of DoD's use of performance-based approaches is important with respect to export controls because DoD's PBL program involves many of the same companies and technologies as do export control regulations.

DoD's objective with PBL is to achieve a certain performance level—weapons system operational capability—while providing contractors the flexibility to determine the best approach. For example, in one aircraft maintenance program, DoD negotiated a contract for a required number of operational flight hours, leaving it up to the contractor to determine the most efficient method to achieve that level of performance.[47]

DoD believes that PBL reduces cost and oversight, but unfortunately does not provide data to support its conclusions.[48] A GAO study of the program found "some evidence that a few PBL arrangements have reduced costs."[49] However, GAO cautioned that some of the results of its PBL study were mixed, and it

---

[38] G. Holahan, Nuclear Regulatory Commission, Risk-Informed Operational Decision Management (RIODM) Lecture at MIT, 2006, cited in George E. Apostolakis, "Risk-Informed Changes to the Licensing Basis."
[39] George E. Apostolakis, "Risk-Informed Changes to the Licensing Basis,"2.
[40] Ibid.
[41] Phone interview with Garill Coles, PNNL, October 17, 2014.
[42] Ibid.
[43] Ibid.
[44] GAO, "National Hazard Assessments Could be More Risk-Informed," April 2012, 25, http://www.gao.gov/assets/600/590431.pdf.
[45] GAO, "Improved Analysis and Cost Data Needed to Evaluate the Cost-Effectiveness of Performance-Based Logistics," December 2008, 1, http://www.gao.gov/new.items/d0941.pdf.
[46] Ibid.
[47] GAO, "DOD Needs to Demonstrate that Performance-Based Logistics Contracts are Achieving Expected Benefits," September 2005, 8, http://www.gao.gov/assets/250/247712.pdf.
[48] Ibid., 3, 8, 11.
[49] GAO, "Improved Analysis and Cost Data," December 2008, 31.

could not say with certainty that the cost improvements resulted directly from PBL.[50] GAO generally concluded that more data is required to determine whether PBL is "achieving expected benefits."[51]

Without data to support DoD's claims, it cannot be concluded that PBL is more efficient or cost-effective than previous logistics methods. However, its preference over previous methods might support an analysis that PBL is either cost-beneficial or more efficient.

4.0 Considering Performance-Based Export Control Regulations

Export control regulations are intended to shape conduct to support several goals. These include the nonproliferation of weapons of mass destruction, control of advanced conventional munitions and firearms, and for purposes of crime control, anti-terrorism, national security, regional stability, and others.[52] This paper is concerned with exports that are controlled to prevent the proliferation of nuclear weapons, specifically items that are covered by the Code of Federal Regulations (CFR) Parts 110[53] and 810,[54] as well as the Export Administration Regulations[55] (EAR) and International Traffic in Arms Regulations[56] (ITAR) for nuclear nonproliferation reasons.

Today, a company completing an export license application must answer a series of yes/no questions that vary little across U.S. export control authorities.[57] Such an approach provides a ready roadmap to legally export controlled commodities, particularly for those with little experience.

For example, under 10 CFR 810 (as of November 2014), nuclear-related activities are either generally or specifically authorized. For generally authorized activities, entities do not have to apply for a license, but need to comply with reporting requirements as identified by DOE's regulations. The approval of a specific authorization, however, requires the Secretary of Energy to determine, with concurrence of the Department of State and in consultation with other agencies, that the activity "will not be inimical to the

---

[50] Ibid., 8, 11.
[51] GAO, "DOD Needs to Demonstrate," September 2005.
[52] "Export Administration Regulations," *Commerce Control List Overview and the Country Chart*, Code of Federal Regulations (CFR), Title 15, Subtitle B, Chapter 7, Subchapter C, Part 738, accessed November 24, 2014, data current as of November 21, 2014, http://www.ecfr.gov/cgi-bin/text-idx?SID=cfc31154ebab309f72d842bc3a3baba2&node=pt15.2.738&rgn=div5.
[53] "Export and Import of Nuclear Equipment and Material," CFR, Title 10, Part 110, accessed November 24, 2014, data current as of November 20, 2014, http://www.ecfr.gov/cgi-bin/text-idx?SID=007f215bde4fa4b4c385ae4df26faa00&node=pt10.2.110&rgn=div5.
[54] "Assistance to Foreign Atomic Energy Activities," CFR, Title 10, Part 810, accessed November 24, 2014, data current as of November 20, 2014, http://www.ecfr.gov/cgi-bin/text-idx?SID=007f215bde4fa4b4c385ae4df26faa00&node=pt10.4.810&rgn=div5.
[55] "Export Administration Regulations," CFR, Title 15, Part 730, accessed November 24, 2014, data current as of November 20, 2014, http://www.ecfr.gov/cgi-bin/text-idx?SID=cfc31154ebab309f72d842bc3a3baba2&tpl=/ecfrbrowse/Title15/15CVIIsubchapC.tpl.
[56] "International Traffic in Arms Regulations," CFR, Title 22, Part 120, accessed November 24, 2014, data current as of November 20, 2014, http://www.ecfr.gov/cgi-bin/text-idx?SID=302801f7f0ef35cd453d8130e4bc54d7&tpl=/ecfrbrowse/Title22/22CIsubchapM.tpl.
[57] See, for example, "Assistance to Foreign Atomic Energy Activities," *Grant of Specific Authorization*, CFR, Title 10 CFR Part 810.10.(b) and EAR 732.1 (b).

interest of the United States."[58] To make the determination, DOE generally considers whether the country of destination is a party to the Treaty on the Non-Proliferation of Nuclear Weapons, whether the country has a safeguards agreement in force with the International Atomic Energy Agency, and whether the United States has a peaceful nuclear cooperation agreement in force with the country.[59]

The Commerce and State Departments, with wider mandates, do not make such narrow non-inimicality determinations. Instead, these two agencies will ask exporters questions similar to:

- Does the commodity to be exported require a license?
- Is the end-user a prohibited party?
- Is the country of destination sensitive or prohibited?
- Is there reason to believe the goods will be used in a prohibited way?

While the approaches differ among export control agencies, the goals are essentially the same, and neither explicitly considers the compliance performance of the exporter.

After a company submits an application addressing the required questions, the regulator then verifies the answers for accuracy. If a company fills in the application with limited due diligence, then the licensing agency's subsequent review is a useful tool for identifying gaps in the application information. However, if a company has completed careful due diligence in filling out its application, the licensing agency's subsequent review could be redundant, at least from a human resources perspective.

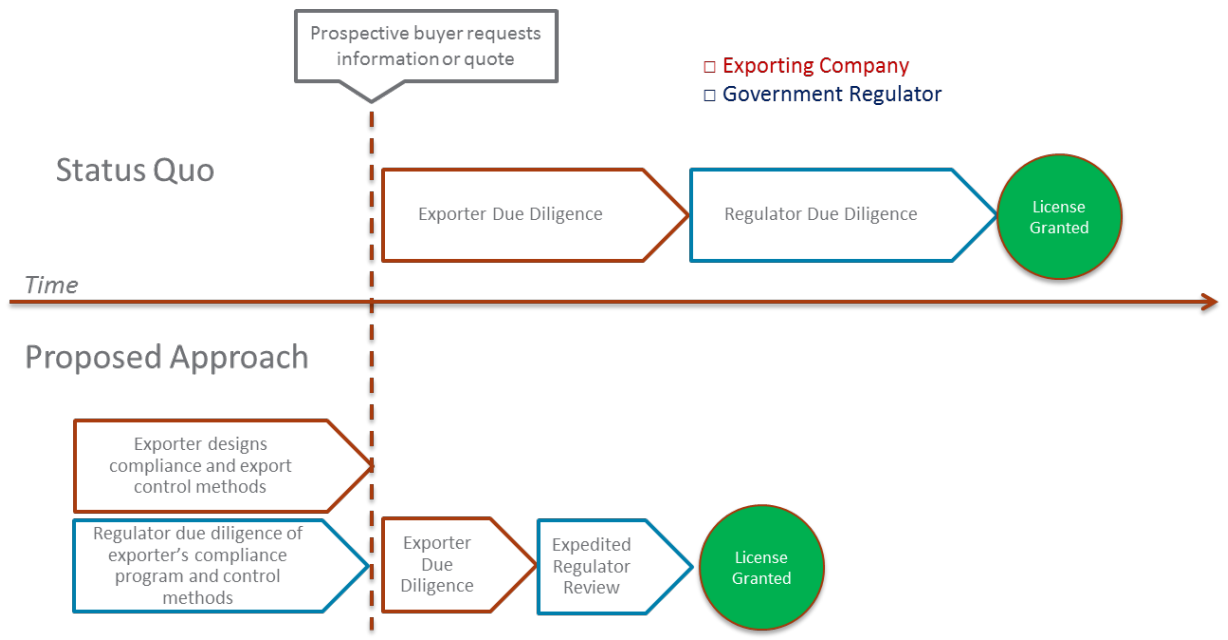
Once a company has conducted due diligence for a given export, the prescriptive tool that the exporting company *must* use to export its item is an export license.[60] This method is aimed at the lowest level of export control competence required to control commodities. An unintended side effect is that prescriptive regulations may not encourage behavior that goes beyond this minimum level. Once a company has achieved the required level of due diligence necessary to obtain an export license, the company receives limited benefit in performing beyond that level.

Another unintended side effect is that regulators might expend unnecessary resources confirming information provided by companies with good internal compliance programs. In this way, prescriptive approaches can be duplicative and inefficient. They do not necessarily promote or recognize innovation because regulated entities must use the prescribed problem-solving method, even if they develop a better option.

To reduce redundancy under a regulatory system that incorporated performance-based approaches, the licensing agency might evaluate whether a company has an adequate licensing due diligence process. Where the company has demonstrated adequate or exceptional performance in export controls, then the licensing agency would not have to focus as much attention on the commodity and end-user for each export because it knows that the company has already done so, and that the agency can trust the company's analysis. An expedited review process would remain in place, potentially for every transaction or for those pertaining to commodities predetermined by regulators to require a review. In this way, regulators would be afforded proper review for sensitive commodities, especially in relation to information that companies may not have, and have the opportunity to double-check and give a final approval. A potential process is illustrated below.

---

[58] "Assistance to Foreign Atomic Energy Activities," *Grant of Specific Authorization*, CFR, Title 10, Part 810.
[59] Ibid.
[60] Unless the item qualifies for a license exception, for example.



Status quo: After a prospective buyer requests information or a quote, the exporter performs due diligence of end-user/end-use, then the regulator performs due diligence of compliance and export control methods, as well as end-user/end-use.

Proposed approach: Prior to requests for information or a quote, the exporter designs and regulator performs due diligence of compliance and export control methods, expediting future regulator reviews.

By adopting PBAs that give weight to a company's internal compliance program, regulators can conduct due diligence of the exporter in advance of potential exports so that downstream processes are more efficient, predictable, and timely. For example, if a company has demonstrated exceptionally compliant behavior, such as by implementing a very strong internal compliance program, regulators could reward that company with increased regulatory flexibility, such as reducing requirements for certain export licenses. Such an approach might also be akin to the Department of Commerce Validated End-User program, where an end-user would submit itself to a rigorous screening process upfront so that companies could export specified commodities to that end-user without licenses in the future.[61]

Potential indicators of exceptional performance and options for reducing regulatory burden are listed below.

[61] "Validated End-User Program," Department of Commerce, Bureau of Industry and Security, http://www.bis.doc.gov/index.php/licensing/validated-end-user-program.

Potential Indicators of Exceptional Performance by Industry[62]
Corporate commitment to nonproliferation
Preferentially sourcing based on supplier nonproliferation bona fides; supply chain due diligence
Internal compliance program and screening software
Robust inventory and delivery controls, post-shipment verification
Regular meetings with regulators and participation in export control rulemaking
Information-sharing of suspicious orders / end-users to regulators or third-parties
Maintaining database of suspicious inquiries and unverified end-users
Timely voluntary self-disclosures
Reporting compliance methods and implementation to a third-party

Potential Options for Reducing Regulatory Burden[63]
Trusted exporter / super-compliant status
"Top of the pile" for licensing (green lane); faster licensing time
Open, general licenses
Intra-company / company-wide transfers
License exceptions
Shorter application procedures
Flexible reporting requirements

These lists are not comprehensive and have not been endorsed by regulators or by industry; the lists are meant to encourage discussion and illustrate potential options and indicators. The openness and flexibility of the process ensures that companies and regulators would create other options not enumerated here.

Regulators might reasonably be concerned that this is a significant amount of trust to place in a company, but that is why the prescriptive controls remain in place as part of the hybrid system. Commodity control lists and end-user due diligence expectations would still remain, among others. If companies do not qualify for the PBA, the status quo remains unchanged for those companies. If they qualify and make a mistake, for example, by allowing an illegal export, then those companies have committed a violation just like any other. Regulators can follow-up to determine whether it was an egregious violation and respond accordingly. Regulators might also consider the companies' participation in the PBA program as a mitigating factor during potential enforcement actions, just as the Commerce, State, and Treasury departments currently do for voluntary self-disclosures.[64]

Under this approach, companies would potentially have a reduced regulatory burden or financial incentive to find efficiencies and improve compliance methods to capitalize on the time saved during the regulatory review process. Export control experience and expertise could become a valuable commodity besides avoiding regulatory trouble—knowledge and proficiency could become integral to maintaining a company's licensing flexibility and its competitive advantage in getting products to customers faster.

Ultimately, performance-based approaches could represent one approach to address several of the primary themes from PNNL's May 2014 seminar. Specifically:

---

[62] Mara Cowan and Andrew Kurzrok, "Robust Indicators of Nonproliferation Performance," Pacific Northwest National Laboratory, February 2014, PNNL-23146, 4, http://www.pnnl.gov/main/publications/external/technical_reports/PNNL-23146.pdf.

[63] Gretchen Hund and Andrew Kurzrok, "Competitive Advantages for Nonproliferation," *Industry Self-Regulation for Nonproliferation*, Pacific Northwest National Laboratory, July 2013, PNNL-SA-97002, 2.

[64] "Penalties," Department of Commerce, Bureau of Industry and Security, Office of Export Enforcement, http://www.bis.doc.gov/index.php/enforcement/oee/penalties.

- Industry suggested that regulators tell companies the desired outcomes of export control compliance and nonproliferation, not the methods needed to be compliant; *this is the foundation of performance-based regulations*

- Participants wondered what can be done to motivate companies to bring nonproliferation into their practices—how to motivate industry to want to do more than just meet their legal/regulatory requirements; *PBAs might motivate companies to bring nonproliferation into their practices by rewarding companies that do so*

- Participants agreed that one-size-fits-all approaches may not be efficient or possible; *PBAs could provide the foundation to implement flexible, tailored, and even potentially unique compliance methods*

- Industry suggested that regulators use a more risk-based approach to licensing; e.g., that it is inefficient to treat two exports equally if the commodities are going to a trusted country versus commodities going to a less-than-trusted country; *PBAs could provide flexibility for industry and regulators to determine varying levels of risk*

- Both industry and government suggested considering whether there might be ways for companies to demonstrate exceptional compliance and therefore require less scrutiny; *PBAs have been implemented for this exact purpose, particularly in EPA voluntary programs, though the level of PBAs' success is unclear*

- Regulators raised the concern that they do not want export controls to become a "box-checking exercise" for compliance— they want companies to seriously consider nonproliferation issues; *PBAs could potentially reward companies that demonstrate proper attention and care, thereby encouraging similar behavior that goes beyond checking boxes*

- Industry expressed concern over the export control difficulties faced by multinational companies that must apply for licenses when exporting within the company and its subsidiaries; *PBAs could potentially allow flexible licensing processes for multinational companies*

- Industry suggested focusing on high-risk activities and minimizing effort and time spent on low-risk activities; *PBAs could potentially give industry the ability to determine risk and allocate its efforts accordingly*

- Industry suggested improved licensing predictability; *PBAs may improve licensing predictability, efficiency, and processing times*

- Participants agreed that two-way information-sharing and cooperation would greatly improve export controls, potentially including partnership with government; *researchers found that a key outcome from EPA's Performance Track was community and government outreach—the same potential might exist for export control regulations*

5.0 Conclusion

Regulatory agencies and academia have not subjected performance-based regulations to rigorous research and analysis.[65] However, the preceding research demonstrates that regulators and regulated entities prefer PBAs to prescriptive approaches.

Better data is needed to inform the potential consideration of PBAs for nuclear nonproliferation. If regulators' and companies' preference for PBAs is due to PBAs' efficiency or cost-effectiveness, there should be ample data to support their use; if PBAs are not an improvement over more prescriptive regulations, regulators and companies need to know. A follow-on study could investigate available datasets and, as feasible, provide a more robust assessment of the cost-effectiveness and efficiency of performance-based approaches.

Regardless of whether data are available on the regulatory side, it is highly likely that companies or facilities have maintained rigorous records to inform their own business case analyses. Due to high upfront costs to companies regarding both the application process and subsequent implementation of PBAs, an executive-level internal discussion and decision process likely took place. These decisions in favor of investments in PBAs were likely supported by internal cost-benefit analyses.

Should PBAs be validated, there may be value for export control agencies to apply them to their regulatory processes. For example, DOE could consider integrating PBAs into the Part 810 regulations based on a non-inimicality finding.

Applied to nuclear export controls, a performance-based approach might be described as focusing on the goal of nonproliferation while allowing some flexibility in the means by which companies control the goods and services along their supply chain. While PBAs require further study, if validated they represent a potentially powerful approach to improving nonproliferation outcomes and enhancing the competitiveness of U.S. firms.

[65] Personal email to author from Dr. Cary Coglianese, University of Pennsylvania School of Law, November 13, 2014.

Pacific Northwest
NATIONAL LABORATORY

Proudly Operated by **Battelle** *Since 1965*

U.S. DEPARTMENT OF
ENERGY

902 Battelle Boulevard
P.O. Box 999
Richland, WA 99352
1-888-375-PNNL (7665)

www.pnnl.gov