Comments to FAA on Cargo Carve-out in Initial Supplemental Regulatory Impact Analysis

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I. Introduction

The Independent Pilots Association ("IPA") is the collective bargaining unit representing the more than 2600 professional pilots who fly in the service of United Parcel Service. IPA submits these comments in response to the Initial Supplemental Regulatory Impact Analysis ("RIA") for the Final Rule issued under the above named Federal Aviation Administration ("FAA") rulemaking docket regarding flightcrew member duty and rest requirements. Notwithstanding a complete lack of congressional authority to consider the costs of regulating flightcrew member duty and rest, FAA critically omits all-cargo pilots from coverage under the Final Rule based on a deeply flawed benefit-cost analysis ("BCA"). In fact, FAA ignores its congressional mandate to issue regulations "based on the best available scientific information," as well as relevant pilot fatigue safety analysis, which supports a *greater* need for duty and rest rules for all-cargo operations, in excluding all-cargo operations from coverage under the Final Rule.

Instead, FAA bases its cargo carve-out on a highly arbitrary and inconsistent analysis in the Initial Supplemental RIA that underestimates the benefits and overestimates the costs of applying the Final Rule to all-cargo operations. Specifically, the Initial Supplemental RIA does not present a reasoned estimate of the risk of a fatigue-related all-cargo accident (i.e., the potential number of accidents that would occur if cargo operations are not covered by the Final Rule), and it fails to include an analysis grounded in realism for potential costs per accident avoided, including damage or destruction of hull and cargo, injury or fatalities of pilots cargo aircraft passengers, and on-the-ground fatalities, property

damage, and environmental cleanup. In contrast, FAA overestimates the cost and impact of compliance, particularly with respect to the projected number of additional pilots necessary to maintain all-cargo operations and the extent and nature of retrofitting aircraft with compliant rest facilities.

FAA's decision to exclude all-cargo pilots from coverage under the Final Rule also runs counter to the agency's own longstanding and consistent practice of applying the same health and safety standards to pilots in both cargo and passenger operations, in order to ensure their fitness to fly. From regulation of pilots' use of alcohol and drugs to health examination and retirement age requirements, FAA has always treated all-cargo and passenger pilots in the same manner. Given that fatigue has at least as great an impact on a pilots' fitness to fly as these other regulated aspects of a pilot's health, FAA's decision to exclude all-cargo operations from the Final Rule is confoundingly arbitrary.

The end result of FAA's inconsistencies, errors, and omissions is to render its decision to omit all-cargo operations from the Final Rule arbitrary and capricious. As a result, IPA requests that FAA cover all-cargo operations in the Final Rule, in accordance with its congressional mandate, rigorous scientific evidence, previous FAA practice, and its own original proposal.

II. Overview of Fundamental Flaws in FAA's Consideration of Cargo Operations

As required by a specific congressional mandate[1] and in recognition of the fact that "[f]atigue threatens aviation safety because it increases the risk of pilot error that could lead to an accident," the FAA proposed amendments in 2010 to its existing flight, duty, and rest

[1] Airline Safety and Federal Aviation Administration Extension Act of 2010, Public Law 11-216, § 212, 124 Stat. 2348, 2362 (2010) ("Safety Act").

regulations to eliminate distinctions between domestic, flag, and supplemental operations.[2] However, despite FAA's acknowledgement that the risks posed by fatigue and the factors leading to fatigue are universal,[3] in 2012 FAA limited the applicability of the Final Rule on Flightcrew Member Duty and Rest Requirements (Final Rule) to passenger operations,[4] and excluded cargo operations.

FAA recognizes the significance of circadian rhythm and time of day in increasing the likelihood of fatigue, but ignores it in analyzing the benefits of applying the Final Rule to cargo operations. FAA acknowledges that science demonstrates that "[f]atigue, sleep loss, and circadian disruption can degrade performance, alertness, and safety,"[5] and apparently agrees with NTSB that "the circadian clock is a powerful modulator of human performance and alertness, and in transportation operations, it can be disrupted by night work, time zone changes, and day/night duty shifts." [6] FAA also cites NTSB's conclusion that "Scientific examination of these physiological considerations has documented a direct relationship to errors, accidents, and safety."[7] Yet this science is ignored in FAA's BCA of applying the Final Rule to cargo operations.

"Research conducted on fatigue, sleep and circadian rhythms" and "Sleep and rest requirements recommended by the National Transportation Safety Board" are factors that

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[2] Flightcrew Member Duty and Rest Requirements; Proposed Rule, 75 Fed. Reg. 55852 (Sept. 14, 2010) ("Proposed Rule").

[3] Final Rule on Flightcrew Member Duty and Rest Requirements, 77 Fed. Reg. 330, 335 (Sept. 11, 2012) ("Final Rule").

[4] *Id*. at 336.

[5] Initial Supplemental Regulatory Impact Analysis, Flightcrew Member Duty and Rest Requirements 21 (Oct. 4, 2012) ("Initial Supplemental RIA") (citing NTSB statement that FAA calls "thorough and well-documented").

[6] *Id*. at 22.

[7] *Id.*

FAA is statutorily required to consider in this rulemaking.[8] However, FAA ultimately rejected the NTSB recommendation to include cargo operations within the scope of the Final Rule, an action NTSB found to be extremely disappointing.[9] In fact, with respect to cargo operations, FAA appeared to disregard its entire premise for developing the rule in the first place: *"Fatigue threatens aviation safety because it increases the risk of pilot error that could lead to an accident"* [10] and that the existing Part 121 rules "do not adequately address the risk of fatigue"[11] and "subject society to an 'unacceptably high aviation accident risk.'"[12]

Yet cost – which FAA was not entitled to consider under its congressional mandate – was not only considered, but was *controlling*, in FAA's decision to exclude cargo operations from the scope of the Final Rule.[13] FAA's estimate of the costs of applying Part 117 to cargo operations is much higher than for passenger operations, despite far fewer cargo flights and crewmembers.[14] What appears to be missing from FAA's calculation, however, is an appreciation of the reason that there would be a considerable impact on cargo operations, and thus, considerable costs, from application of the Final Rule. Specifically, FAA does not appear to give any consideration to the fact that cargo operations include a great number of flights that are considered to pose particular hazards under the scientific

[8] Safety Act, §212(a)(2)(F).

[9] Press Release, NTSB, Statement from NTSB Chairman Deborah A.P. Hersman on New FAA Flight and Duty Time Rule (Dec. 21, 2012), *available at* http://www.ntsb.gov/news/2011/111221_2.html (attached as Exhibit 1).

[10] Final Rule at 395 (emphasis added).

[11] *Id.* at 334.

[12] *Id.* at 391(quoting Proposed Rule at 55882).

[13] *Id.* at 336.

[14] Initial Supplemental RIA at 73-74.

principles announced by FAA,[15] such as back-of-the-clock flying across time zones when pilots are at their circadian lows.[16]

Thus, the Final Rule leaves in place an excessive amount of non-compliant operations that have a high risk of inducing fatigue. Continuing to allow these operations does nothing to reduce the chances of a fatigue-related accident for all-cargo flights. Because the cargo carve-out was apparently thrust upon FAA at the 11th hour by OMB,[17] FAA has not been able to reconcile the fundamental basis for the rule (eliminating those operations that science demonstrates are most likely to induce fatigue in pilots), with the actual provisions of the rule – which leave in place a disproportionate number of dangerous fatigue-inducing operations because the planes carry cargo, not passengers.

The dissonance between the principles espoused by FAA (based on the factors Congress directed FAA to consider) and the resulting Final Rule (based on a single factor, costs, that Congress did not authorize FAA to consider) is caused by FAA's failure to adhere to the congressional mandate to use the best available scientific information to

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[15] FAA observed that "fatigue is most likely, and, when present, most severe, between the hours of 2 A.M. and 6 A.M.," also known as the "Window of Circadian Low." Final Rule at 333, 348. FAA also listed several "aviation-specific work schedule factors" that "can affect sleep and subsequent alertness," including "night work through one's window of circadian low, daytime sleep periods, and day-to-night or night-to-day transitions." *Id*. at 333–34. It noted that "according to the industry commenters . . . these types of nighttime and around-the-world operations are the norm for all-cargo carriers." *Id.* at 336. For example, for the All-Cargo Narrow-Body scenario, "Nearly all duty periods occurred during nighttime hours and most duty periods infringed on the window of circadian low (WOCL)." GRA, Inc., Summary of Crew Pairings, Inc. Economic Analysis of Flightcrew Duty and Rest Requirements Rulemaking 40 (Sept. 2012) (footnote omitted) ("GRA Report"). Similarly, for the All-Cargo Wide-Body scenario, GRA states that, "Many duty periods occurred during nighttime hours and most duty periods infringed on the window of circadian low (WOCL)." *Id.* at 45. Because FAA was directed by Congress to consider the best science available, which clearly demonstrates that there is a great risk of fatigue during the WOCL, FAA cannot ignore this issue.

[16] Proposed Rule at 55854-55856; Final Rule at 333-335; Regulatory Impact Analysis, Flightcrew Member Duty and Rest Requirements 15-20 (Nov. 18, 2011) ("Final Rule RIA"); Initial Supplemental RIA at 19-24.

[17] FAA Compliance with EO 12866 for Final Rule (Jan. 23, 2012) (FAA Dckt. No. 2009-1093-2518) ("EO 12866 Compliance").

develop the rule. FAA itself states that the science relating to fatigue is uncontroversial.[18] As discussed below, FAA's attempt to use a BCA to rationalize OMB's "requested" exclusion of cargo operations from the Final Rule, was contrary to Congress's mandate to the agency. FAA was thus caught between following the directive of Congress and following the explicit "request" from OMB, with regard to the specific terms of the Final Rule. Given that FAA is part of the Executive Branch, and OMB stood between FAA and issuance of the Final Rule, it is not surprising that OMB's views prevailed.[19] But the fact that FAA's action was bureaucratically understandable does not make it legitimate.

Where Congress enumerates the factors it wants an agency to consider, an agency is not allowed to use other factors not specified by Congress to override the conclusion that would result from a reasoned consideration of the factors specified by Congress.[20] This applies especially to consideration of costs, which courts have acknowledged can overwhelm all other considerations.[21] Moreover, FAA's disregard for the directive from Congress is magnified by its dogged insistence that past fatigue-related accident history (one cargo accident in ten years) dictates the chances of future accidents, rather than scientific consideration of the factors that lead to fatigue-related accidents, as Congress had intended. Only by impermissibly disconnecting the scientific findings from the projection of avoided accidents as benefits of the Final Rule could FAA achieve the anomalous result that it did: (1) excluding from the scope of the Final Rule precisely the types of operations (cargo) that

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[18] Final Rule at 390.

[19] Unfortunately, in its effort to meet the Congressional directive to issue the rule within 12 months, Safety Act at § 212(a)(3)(B), FAA compromised on the fundamental principles that Congress directed FAA to follow in determining the substance of the rule.

[20] *See Whitman v. Amer. Trucking Ass'ns, Inc.*, 531 U.S. 457, 468 (2001).

[21] *Id.* at 469.

have the greatest prevalence of factors that science deems most dangerous for inducing pilot fatigue, i.e., operations during the pilots' circadian lows that cross multiple time zones,[22] while (2) including within the Final Rule passenger operations, which have a lesser share of non-compliant operations.

By excluding all-cargo operations from new flightcrew member duty and rest rules, and leaving them subject to the existing rules that FAA admits leave the public exposed to an unacceptable safety risk,[23] FAA disregarded its congressionally mandated duties to make safety its highest priority and issue new duty and rest rules based on the best available scientific information to address the problems of pilot fatigue. FAA has failed to address those serious health and safety problems, leaving IPA's members and all cargo pilots exposed to an existing rule that even FAA admits does "not adequately address the risk of fatigue."[24]

FAA Applies Inconsistent Reasoning to Cargo and Passenger Operations

FAA's ostensible reason for excluding cargo operations from the scope of the Final Rule is that the costs of compliance by cargo operations vastly exceed the modest benefits based on the historical accident rate.[25] However, even the modest benefits attributed by FAA to the application of the rule to cargo operations greatly exceed the benefits of the

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[22] *See supra* n.15; *see also* Proposed Rule at 55858 ("there is ample science indicating that performance degrades during windows of circadian low [2 A.M.–6 A.M. or "WOCL"] and that regular sleep is necessary to sustain performance"); *id.* at 55860(the "reduction in maximum FDP during nighttime hours is broadly supported by existing sleep science")*; id.* at 55855 ("Several aviation-specific work schedule factors can affect sleep and subsequent alertness . . . includ[ing] early start times, extended work periods, insufficient time off between work periods, . . . night work through one's window of circadian low, daytime sleep periods . . . .") (footnote omitted); *id. at 55867*.

[23] Final Rule at 391 (quoting Proposed Rule at 55882).

[24] Proposed Rule at 55855.

[25] Final Rule at 336; Initial Supplemental RIA at 40, 90.

Final Rule in relation to *mainline* (i.e., not regional) *passenger operations*, for which there were *zero* accidents in the past ten years. Thus, under FAA's reasoning related to cargo operations there would be *no benefits* gained by applying the Final Rule to mainline passenger operations,[26] but hundreds of millions of dollars in compliance costs.

FAA highlighted the fact that there were no mainline cargo accidents when it determined that the appropriate aircraft size for the assumed future fatigue-related passenger airline accidents (in the absence of the Final Rule) was an 88-seat aircraft, because the only passenger accidents were by regional airlines, not mainline passenger carriers.[27] In fact, the FAA states it abandoned its traditional risk analysis method[28] due to "a disproportionate risk among smaller, regional carriers."[29] This is based on the observation that six out of the six fatigue-related passenger aircraft accidents during the last ten years were operated by regional carriers.[30] The much larger aircraft operated by the mainline passenger carriers is ignored in the FAA's societal benefit estimates, even in the "high" benefit case, tacitly acknowledging *FAA's unstated belief that application of the Final Rule to the mainline*

[26] Initial Supplemental RIA at 40.

[27] *Id.* at 36, 38-39.

[28] The FAA explicitly states that it typically bases its cost-benefit analysis forecasts and projections on "expected distributions around the mean" and by examining "future risk exposure" and "increasing aircraft size, expected load factors, and a breakeven analysis." *Id.* at 36.

[29] *Id*. at 36, 39.

[30] There is some confusion as to whether FAA considered 6 or 3 fatigue-related passenger accidents within the previous ten-year time frame. FAA lists six such accidents between 2002 and 2011 in Table 7-20 Year Accident History on p. 30 of the Interim Supplemental RIA. In the base case discussion, FAA stated that it "assessed the effectiveness of this rule to prevent the six fatigue-related accidents which occurred on passenger-carrying aircraft in a recent 10-year period." Interim Supplemental RIA at 36. In the high case scenario, FAA "narrowed the analysis of the six historic accidents which were catastrophic (all onboard died). *Id*. at 38. It is not clear why, for a "high case scenario," FAA would not have considered both fatal and non-fatal accidents.

airline passenger industry or operating crewmembers does not provide a measurable societal benefit from 2014 to 2023.

Notwithstanding this observation, FAA extended the Final Rule to all passenger operations. FAA cannot legitimately assert that significant costs and few projected benefits based on avoidance of historical accidents and is a reason to exclude cargo operations, when it has not applied that same reasoning to mainline passenger operations, which also incur significant costs and would, using FAA's analysis, realize even fewer (i.e., zero) benefits from complying with the Final Rule.

The only way that FAA could extend the rule to mainline passenger operations is if it adheres to the premises that (1) past accident history does not govern future accidents and (2) there is value in eliminating dangerous fatigue-inducing pilot duty periods, notwithstanding the lack of fatigue-related accidents in that airline sector in the past ten years and a projection that there are little or no benefits based strictly on that accident history. FAA acted arbitrarily in following this reasoning for mainline passenger operations, but not for cargo operations.

FAA's failure to apply its reasoning consistently demonstrates that FAA's decision was not rational, but rather, was contrived; most likely it was the result of lobbying by cargo carriers, instead of the reasoned application of commonly accepted and recognized BCA principles. FAA states that factors that induce fatigue are universal,[31] which means that they apply to cargo operations as well as passenger operations, and FAA should have treated cargo and mainline passenger operations alike in determining net benefits necessary to be

[31] Final Rule at 330.

included within the scope of the Final Rule.[32] In fact, rather than supporting FAA's decision to exclude all-cargo operations from the Final Rule, FAA's analysis of the "best available scientific information" underscores the *greater need* to adopt new rules for all-cargo operations, because those operations are *particularly* subject to factors that create dangerous levels of fatigue. FAA found that flying conditions such as *nighttime operations* (during pilots' circadian lows) and *operations that cross multiple time zones* warrant *stricter* measures to guard against fatigue.[33] Specifically, "[t]he primary time-of-day safety concern . . . is that flightcrew members who fly during the WOCL *suffer a severe degradation of performance*."[34] A major weakness of the Interim Supplemental RIA is basing it on a

[32] IPA believes that Congress intended FAA to issue regulations governing all categories of operations, in order to guard against dangerous levels of fatigue in commercial pilots. This is consistent with the scientific findings, which Congress directed FAA to follow and which FAA has cited for its conclusions that the factors that induce fatigue are universal and affect all pilots. However, if FAA is going to consider costs and benefits and exclude a class of operations from the scope of the Final Rule, the agency, in light of its Congressional mandate to develop rules to address pilot fatigue, should have tailored any carve-out from the rules to be *as narrow as possible*, rather than including the entire cargo industry in the carve-out. For many reasons, the operations of the integrated freight carriers (UPS, FedEx, and Airborne) are much more similar to passenger operations than on-demand cargo operations. For example, integrated freight and passenger operations are characterized by hub and spoke concentrations of flights in crowded skies to urban centers. FAA's analysis of the operational costs of compliance for integrated freight sets the costs at $32 million per year (or $320 million over ten years) as opposed to $52 million per year (or $521 million over ten years)**,** roughly 61% of the compliance costs for all cargo operations. Initial Supplemental RIA at 68, Table 21 and 75, Table 25. As discussed below, closer analysis of FAA's calculations will lead to additional reductions in costs, particularly regarding the percentage of lineholder versus reserve pilots, offsets based on reduced sick leave, and FAA's calculation of non-operational costs, e.g. costs of retrofitting aircraft with adequate rest facilities, which appears to be overstated, while the benefits of applying the Rule to cargo operations are seriously understated. Thus, it is likely that a thorough and reasoned BCA would show a benefit-cost ratio for integrated freight operations roughly comparable to that calculated for passenger operations that FAA included in the Final Rule.

[33] Final Rule at 330.

[34] *Id.* at 358 (emphasis added). *See also id.* at 331, 355. FAA also cited scientific evidence that "long duty periods that take place during the WOCL substantially increase the risk of an accident;" that "each additional hour worked after approximately 8 or 9 hours exponentially increases the risk of an accident;" and that "there is little evidence that a flightcrew member who repeatedly works on nightshifts will experience substantial safety-relevant changes to his or her circadian rhythm through acclimation." *Id.* at 357.

statistically insignificant sample size of one accident in ten years for cargo operations. Even assuming that the total fatigue-based accident rate will remain the same, due to the small sample size (4 fatigue related accidents included in the BCA high case analysis[35]) for cargo and passenger accidents in the past ten years, there is simply no statistical or analytical basis for assuming that the split among fatigue-related accidents will be 3 passenger accidents and 1 cargo accident, rather than evenly split with 2 cargo accidents and 2 passenger accidents, or 1 passenger accident and 3 cargo accidents. This is especially true since FAA acknowledges that (1) excessive fatigue impairs judgment and ability to react appropriately to unexpected events; (2) accidents occur randomly and are somewhat unpredictable;[36] and (3) the factors that exacerbate pilot fatigue (flying during the WOCL and across multiple time zones) are especially prevalent in cargo operations.[37] Yet, FAA did not even consider or discuss the possibility that fatigue-related cargo accidents could equal or exceed passenger accidents, thus committing a fundamental flaw at the outset of its analysis.

FAA stated that historical accident rates are an important reference point from which to begin projecting future accidents.[38] This may be true, but, unfortunately, FAA never moved beyond the starting point, even when presenting a "high case" of potential benefits of including cargo operations in the Final Rule. When air safety is at stake – and Congress has directed the agency to act to reduce fatigue-related accidents – it is impermissible for the agency to make only a cursory pass at the fundamental assumptions that dictate the outcome

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[35] Initial Supplemental RIA at 38. *See also* 20-Year Database for Pilot Fatigue-Related Aircraft Accidents, attached as Exhibit 2.

[36] Final Rule at 393; Initial Supplemental RIA at 35.

[37] Final Rule at 333-334, 336, 348.

[38] Initial Supplemental RIA at 35.

of the analysis.

FAA's Benefit-Cost Analysis was flawed

Applicable Standards for Benefit-Cost Analyses

Case law

"When an agency's decision rests on the results of a cost-benefit analysis, it must correctly consider both the costs and benefits of the rule." *See Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Ins. Co.*, 463 U.S. 29, 55 (1983) (agency decision to rescind seatbelt rule was arbitrary and capricious because agency was too quick to dismiss the safety benefits of seatbelts); *Business Roundtable v. Sec. and Exch. Comm'n*, 647 F.3d 1144, 1152 (D.C. Cir. 2011) (final rule arbitrary and capricious where SEC "duck[ed] serious evaluation of the costs . . . imposed upon companies from use of the rule"); *Advocates for Highway and Auto Safety v. Fed. Motor Carrier Safety Admin.*, 429 F.3d 1136, 1146 (Dec. 2, 2005) (FMCSA's final rule is arbitrary and capricious in part because its new BCA "says practically nothing about the projected benefits"); *Office of Commc'n of the United Church of Christ v. Fed. Commcn's Comm'n*, 707 F.2d 1413, 1440 (May 10, 1983) (FCC's decision to eliminate a rule requiring radio stations to keep logs of their programming was arbitrary and capricious because FCC had not fully considered the benefits of the logging requirements in its BCA, which was the exclusive basis for the agency's decision).

Executive Orders

The underlying applicable Executive Order requires agencies to "assess all costs and benefits," including "both quantifiable measures (to the fullest extent that these can be usefully estimated) and qualitative measures of costs and benefits that are difficult to

quantify, but nevertheless essential to consider."[39] The supplemental Executive Order likewise directs agencies to "use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible."[40]

According to a key Administration official,

> "[C]ost benefit-analysis should not put regulation in an arithmetic strait jacket; that there are values and morals, distributional, aesthetic, and otherwise, that have to play a part in the overall judgment about what is to be done. I would emphasize that there are limits to purely economic approaches to valuation of cost and benefits."[41]

BCAs are to be used judiciously as a guide and in conjunction with other factors. However, it appears that the BCA results provided the sole basis for the carve-out of cargo operations from the Final Rule; this is inconsistent with the intent of Executive Order 13563 and the direction contained therein. In the big picture, applying the Final Rule to cargo and passenger operations, alike, offers significant safety benefits due to the potential for preventing fatigue-related accidents. Omitting a major segment of commercial operations from mandatory compliance seriously erodes the potential social benefits that may be realized and continues to foster an air transportation environment that jeopardizes public safety.[42]

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[39] Executive Order 12866 § 1(a) (Oct. 4, 1993) ("EO 12866").

[40] Executive Order 13563 § Sec. 1(c) (January 18, 2011) ("EO 13563").

[41] Hearing on Nomination of Cass R. Sunstein to be Administrator, Office of Information and Regulatory Affairs, Office of Management and Budget Before the S. Comm. on Homeland Sec. and Govt. Affairs 9 (2009) (statement of Cass R. Sunstein) available at http://www.gpo.gov/fdsys/pkg/CHRG-111shrng51041/pdf/CHRG-11shrg511041.pdf. Sunstein was a major contributor to the content of EO 13563.

[42] FAA acknowledges that the existing Part 121 rule, under which cargo operators would continue to operate inadequately safeguards against pilot fatigue. Proposed Rule at 55855, Final Rule at 334, 391.

OMB Guidance DOT, FAA Guidance

The OMB Office of Information and Regulatory Affairs OIRA) has prepared "a primer to assist agencies in developing regulatory impact analyses (RIAs), as required for economically significant rules by Executive Order 13563, Executive Order 12866, and OMB Circular A-4."[43] Particularly relevant to this rulemaking, the guidance recognizes that reasoned decision-making does not consider net benefits in isolation, but rather in the context of significant non-quantified benefits:

> When important benefits and costs cannot be expressed in monetary units or quantified in any manner, the BCA can provide useful information about the relative merits of regulatory alternatives, but the "net benefits" estimate, viewed in isolation, may be incomplete and misleading.[44]

FAA's flat statement in the Final Rule that the "compliance costs significantly exceed the quantified societal benefits" based on the "projected benefit of avoiding one fatal all-cargo accident"[45] as a basis to exclude cargo operations from the scope of the rule underscores the fact that FAA viewed the crudely estimated benefits in isolation, contrary to the admonition to consider quantified benefits in the context of non-quantified benefits. OMB also recognizes that "Agencies should carry out a careful evaluation of non-quantifiable and non-monetized benefits and costs."[46] This careful evaluation includes the following:

> *Benefits and costs that are difficult to quantify*. If the agency cannot quantify a benefit or cost, the agency should explain why and present any

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[43] Office of Information and Regulatory Affairs, Regulatory Impact Analysis: A Primer 1, available at http://www.whitehouse.gov/sites/default/files/omb/inforeg/regpol/circular-a-4_regulatory-impact analysis-a-primer.pdf (attached as Exhibit 3).

[44] *Id*. at 4.

[45] Final Rule at 332, 332 n.1.

[46] OMB Guidance at 12.

> available quantitative information. For example, the agency may not be able to quantify the number of individuals exposed to a risk but may be able to quantify the magnitude of the risk to those who are exposed.
>
> The agency should include a summary table that lists all significant unquantified benefits and costs, highlighting (e.g., with categories or rank ordering) those that the agency believes are most important (e.g., by considering factors such as the degree of certainty, expected magnitude, and reversibility of effects).[47]

FAA did none of this, and it appears that the difficult to quantify benefits were given no consideration by the decision-makers.

OMB's guidance further recognizes that "Regulatory analysis requires forecasts about the future. What the future holds, both in the baseline and under the regulatory alternative under consideration, is typically not known for certain."[48] To deal with this difficulty, OMB states that:

> The important uncertainties connected with the regulatory decision should be analyzed and presented as part of the overall regulatory analysis. The goal of the agency's uncertainty analysis is to present both a central "best estimate," which reflects the expected value of the benefits and costs of the rule, as well as a description of the ranges of plausible values for benefits, costs, and net benefits, which informs decision-makers and the public of the degree of uncertainty associated with the regulatory decision.[49]

In dealing with analysis of uncertainties analysis:

> The agency should also characterize ranges of *plausible* benefits, costs, and net benefits of each regulatory alternative. The goal is not to characterize the full range of *possible* outcomes, which may turn out to be extremely large, but rather the range of *plausible* outcomes as in a confidence interval. The agency must use its judgment on the range of scenarios that such ranges should reflect. *At a minimum, the range should*

[47] *Id.* at 13.

[48] *Id*. at 14.

[49] *Id.* at 14.

> *include a "high" and a "low" scenario that provide plausible upper and lower bounds.*[50]

In this rulemaking, as discussed further, below, FAA did not provide either a plausible lower bound or a plausible upper bound for benefits or for costs.

FAA Guidance

FAA has developed a guidance document to assist in the preparation of BCAs.[51] Like the OMB guidance, it also prescribes careful consideration of factors that are difficult to quantify:

> A natural follow-on to quantification of benefits and costs is the identification and description of intangibles--those things which cannot be evaluated in dollar terms. Intangible considerations should be listed and described for the decisionmaker. If possible, a range in which a dollar value could be reasonably expected to fall should be reported.[3] Intangibles should not be neglected; it is very likely that they will be extremely important to the outcome of the analysis.
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> Footnote 3 states that: [3]Note that to the extent that a benefit or cost initially thought to be an intangible can be described with a minimum and maximum value and characterized by a probability distribution, it may be possible to treat it as a quantifiable item in the variability analysis.[52]

As discussed below, in the Initial Supplemental Regulatory Impact Analysis, FAA did not list and describe even those intangibles that the agency itself had previously acknowledged as being important, such as avoidance of ramp/taxiing accidents, alert pilots as good decision-makers to deal with

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[50] *Id.* at 15 (emphasis added).

[51] Economic Analysis of Investment and Regulatory Decisions—Revised Guide, Federal Aviation Administration, Office of Aviation Policy and Plans (January 1998), available at http://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/ (last visited on Jan. 24, 2013) (attached as Exhibit 4).

[52] *Id.* at 2-5.

unforeseen circumstances, and general health benefits to pilots. FAA also advised that:

> Because uncertainties are always present in the benefit and cost estimates used in the comparison of alternatives …, a complete picture of the situation can best be presented only if this uncertainty is explicitly considered. Techniques for doing so include sensitivity analysis, . . .[53]

While FAA performed some sensitivity analyses on the cost side, the range of such sensitivity analyses was not sufficient, in some cases, as discussed below. Moreover, on the benefit side, FAA did not perform sensitivity analyses, despite the fact that the uncertainties are even greater on the benefits side, such as estimating the number and impacts of accidents.

Finally, FAA notes that, "it should be recognized that an accident risk estimate is a forecast which should be based on a logical extrapolation of all currently available information and data. In fact, the choice of an estimating approach will often be driven by the amount and quality of data available."[54] This indicates that FAA's decision in this instance to use the past ten years as an "exact mirror" for fatigue related accidents in the next ten years is not considered appropriate under the agency's own guidance.

General Problems with FAA's Benefit-Cost Analysis

The Interim Supplemental RIA Reflects FAA's Impermissible Inconsistency in the Level of Rigor in Examining Costs vs. Benefits

BCAs can provide regulators with useful information on benefits and costs even when quantification is highly uncertain, as is generally true of safety regulations.

[53] *Id.* at 2-6.

[54] *Id.* at 3-8 to 3-9.

Developing defensible estimates of regulatory impacts is critical to the utility of BCAs as an aid to decisions among regulatory alternatives. This is accomplished, in part, by ensuring that the operations of the relevant parties and the impacts of a rulemaking are accurately represented, and that the approach is consistent with economic principles, customary and usual analytical techniques, reasonable assumptions, and applicable federal government direction and guidance. It is also important that comparable rigor is applied to addressing costs and benefits to avoid skewing the results. The BCA should present, to the extent practicable, a realistic and plausible estimate of the impact of a rulemaking.

Somewhat remarkably, FAA tacitly admits that it has put its thumb on the scale to skew the results of the BCA by overstating costs and understating benefits. FAA explicitly acknowledged that that it has overstated costs.[55] In fact, "*The FAA believes that carriers will be able to reduce much of the cost* shown in Table 21 [relating to Annual Crew Scheduling Costs]."[56] Thus, FAA believes that much of its $52 million in annual compliance costs for all-cargo operations will never actually be incurred by the carriers. Thus, FAA's purported cost figure does not provide a "plausible upper bound" for costs, as OMB has directed agencies to include in their BCAs.[57]

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[55] Initial Supplemental RIA at 69.

[56] *Id.* at 68 (emphasis added).

[57] OMB Guidance at 15. IPA recognizes the potential irony of citing OMB Guidance that agencies include plausible upper and lower bounds, when it appears that OMB essentially directed FAA to cook the books in its Regulatory Impact Analysis. *See* EO 12866 Compliance. However, the fact that OMB disregarded its own guidance does not mean that the guidance was wrong. It means that OMB was wrong first to insist that FAA consider costs (see below, relating to FAA's statutory mandate not allowing consideration of costs), and, after requiring a benefit cost analysis, to preordain the result of that analysis in this rulemaking. Instead OMB should have allowed the RIA to be prepared in an objective and professional manner, consistent with its guidance that the RIA could be used as a tool by the decision-makers, rather than simply serving as an after-the-fact rationalization for a decision that had already been made.

FAA also states that it included "conservative" assumptions for benefits.[58] It should be noted that "conservative assumptions" in this context does not mean "careful assumptions." Rather, it means that the assumptions relating to benefits are deliberately understated. Overestimating costs and underestimating benefits unfairly and inappropriately biases the results of the BCA. In order to make its BCA conform to applicable guidance and have some integrity, FAA should correct for these acknowledged biases by developing estimates for costs and benefits that are realistic and commensurate with current and future air cargo operating practices.

The Interim Supplemental RIA reflects far less rigor in the development of potential benefits of applying the Final Rule to cargo operations, than in the development of potential costs of compliance. The range of considerations and the level of detail undertaken by FAA in analyzing cost impacts related to crew scheduling and installation of rest facilities aboard aircraft[59] is overwhelming in comparison to the narrow scope and crude formulations used to analyze potential benefits.[60] FAA engaged in extensive study of airline operations to gather information on costs, and strained to find costs, such as the dubious notion that retrofitting aircraft would be performed so as to extend the time the planes were out of service, rather than in concert with normal aircraft downtime or maintenance schedules. Identification and quantification of benefits was not pursued with similar intensity. Such

[58] *Id.* at 35. "We understand that future accidents will not be identical to historical accidents, but our approach provides a conservative look at the benefits of this rule based on a snapshot of the past." FAA apparently assumes, but does not explain why, it is good to provide a "conservative look at the benefits."

[59] *Id.* at 75-83.

[60] As discussed below, despite FAA's extensive efforts to estimate costs, it made several significant errors, for instance in its analysis of (1) line crew/reserve crew impacts on crew scheduling, (2) reduced abseentism/sick leave, and (3) costs of retrofitting aircraft with compliant rest facilities.

disparity and inconsistent application of methodology does not reflect an unbiased, professional effort to provide an objective RIA. The result is a significant lack of cost realism with regard to the estimated benefits and compliance costs for cargo-only operations.

FAA's cursory assessment of benefits is facially insufficient to address the serious safety problem Congress directed FAA to solve. *See Motor Vehicles Mfrs. Ass'n*, 463 U.S. at 55 (weighing of costs and benefits must take into account that "Congress intended safety to be the preeminent factor"); *Advocates for Highway and Auto Safety*, 429 F.3d at 1146 (rejecting cursory examination of the benefits of a rule). Moreover, FAA's summary analysis demonstrates a "complete failure to examine [the issue] in an orderly fashion," a "fundamental problem" that warrants additional work by FAA. *See Office of Commc'ns*, 707 F.2d at 1440.

FAA Failed to Include a Wide Range of Benefits in the BCA

FAA skewed the results of the BCA, through its failure to analyze benefits of the Final Rule that the agency itself identified (e.g., avoidance of aircraft taxiing accidents, benefits of alert pilots as decision-makers in responding to unexpected events, and general health benefits for pilots who avoid chronic fatigue). Moreover, FAA failed to even consider obvious, additional potential benefits, such as avoiding (1) damage to persons and property on the ground, (2) injuries or deaths to "dead-heading" crews or non-revenue passengers occupying cargo jump seats, (3) business or personal loss by the intended recipients of time-sensitive materials, such as critical components for infrastructure systems and manufacturing facilities, medical supplies, equipment, and donor organs, (i.e., the

premium economic value related to overnight package delivery services), and (4) the loss of airline revenues for failure to deliver destroyed packages.

This distortion is compounded by deficiencies in FAA's analysis of the benefits it did consider, such as the unrealistic assumptions relating to valuation of aircraft hulls and associated cargo payloads. These deficiencies give the appearance of a results-driven effort that provides no meaningful assistance to regulators in making a well-informed decision on the scope of the Final Rule. To correct these mistakes, FAA should develop realistic accident scenarios based on accurate air cargo operating characteristics, and subject them to appropriate sensitivity analysis.

FAA did not set forth customary and usual low and high benefits cases as mandated by OMB guidance,[61] but rather truncated them to "lower than low" (which FAA called the "base case" [62]) and "barely more than low," (which FAA called the "high case)." In light of the significant variables at issue in attempting to predict the accidents that could be avoided by applying the Final Rule to cargo operations, the high case benefits assumptions in a professionally prepared BCA would reflect the upper range of reasonably plausible results.[63] Moreover, FAA should have included significant sensitivity analysis to the benefit variables, as it did for cost variables. It is especially important to give serious consideration to a greater range of factors in developing a high case for benefits, and performing sensitivity analysis for benefits variables, because they suffer from greater uncertainty than

[61] OMB Guidance at 15.

[62] While the term "base case" may be a familiar term to analysts and forecasters, as it is used in inductive mathematics to denote the "low-end" outcome, it is not a term commonly understood by the public. It can easily be confused by the general public and media to mean the "expected" or "average" outcome. IPA recommends that FAA use the term "low case" in lieu of "base case," as "low case" is more typically used in BCAs and is an appropriate counterpoint to the "high case."

[63] *Id.*

do the cost variables for which FAA did perform a sensitivity analysis. Key variables associated with safety benefit estimation worthy of sensitivity analysis include the number of fatigue-based accidents otherwise expected in the ten-year benefits study period, the number of persons on board the aircraft, the size and value of the aircraft, and potential harm to persons and property on the ground.

Overview of Flaws in FAA's Assessment of Benefits of Applying the Final Rule to Cargo Operations

In the Interim Supplemental RIA, FAA calculates total benefits of $ 5.3 million in the "base case" and $ 31.4 million in the "high case," each of which assumes a single fatigue-related cargo accident. Before turning to the issue of how many avoided accidents should be considered in the "high case," it is important to note that, even assuming only one accident, FAA's "high case" is not realistic on the basis of insurance valuation alone. Tellingly, *UPS insures itself for **$1.5 Billion** for all costs related **to a single aircraft accident.***[64] It is certainly possible that UPS over-insures to some extent. However, it is implausible that a company that has access to professional risk managers and assessors would ***over-insure by over $1.47 Billion*** for a claim that could only reach $31.4 million, an over-insurance amounting to almost ***48 times*** the maximum likely costs it could incur if FAA's "high case" estimate of costs related to a single cargo plane accident were realistic.

The insurance practices of a company that is actually at risk from an air cargo aircraft accident should certainly be taken into consideration by FAA. The extent to which a company assesses its own risk should carry some weight as FAA analyzes whether it has seriously underestimated the "high case" costs for a cargo aircraft accident. Even if UPS

[64] United Parcel Service Certificate of Insurance (Nov. 16, 2011) (attached as Exhibit 5).

carries double the insurance that it really needs, that would mean that it believes that the costs of a single accident could range up to $750 million. Assuming it over-insured by a factor of 3 would mean that the costs could range up to $500 million, and if it over-insured by a factor of 4, that would mean that the costs of a single cargo aircraft accident could reach up to $375 million. Conservatively, speaking, therefore, a true "high case" of costs for a single cargo accident could run from ***10 to 25 times more than FAA estimated***.

Factors that may have led FAA to vastly understate the potential benefits of avoiding a cargo accident include its failure to include the avoidance of costs such as (a) potential loss of life of non-crew passengers; (b) the potential for damage to persons or property on the ground; (c) the loss to shippers and recipients of the value of the various packages and cargo aboard the aircraft; (d) the business loss resulting from delays in obtaining time-sensitive materials, such as critical components for infrastructure systems and manufacturing facilities; (e) potential lives lost from failure to deliver critically needed medical supplies or equipment, as noted by cargo carriers in the record; (f) the absolute loss of unique materials; (g) the loss of revenues for failure to deliver destroyed packages; (h) potential short and long-term medical costs if persons are severely injured or burned rather than killed;[65] (i) the potential impacts to persons and the environment of the release of

[65] Although FAA states that the costs of avoiding severe injuries are much less than the costs of avoiding deaths, this is not the case where someone suffers critical injuries such as burns, paralysis, etc. As an example, the highest award from the 9/11 Victim Compensation Fund was paid to an injured survivor, rather than to the family of a person who had died. *Compare* Sep. 11th Victim Compensation Fund of 2001, Compensation for Personal Injury Victims, http://www.justice.gov/archive/victimcompensation/payments_injury.html (attached as Exhibit 6) (maximum award of $8.6 million) *with* Sept. 11th Victim Compensation Fund of 2001, Compensation for Deceased Victims, http://www.justice.gov/archive/victimcompensation/payments_deceased.html (attached as Exhibit 7) (maximum award of $7.1 million).

hazardous materials, including fuel, that are routinely carried aboard cargo aircraft; and (j) the loss of service for an aircraft that is destroyed in an accident.

While it could be argued that the "low case" for benefits legitimately could include a conservative estimate of avoided costs, they should nonetheless bear some relationship to reality. FAA's analysis is devoid of realism in assuming that the only benefits of applying the Final Rule to cargo operations relate to avoiding one fatal cargo accident and that the value of a lost aircraft hull is $1.8 million, based on an aircraft that will not even be in the fleet during the operable timeframe, as explained in more detail, below.

Moreover, FAA's underestimation of benefits is exacerbated by the fact that its "high case" does not even consider the possibility that more fatigue-based accidents involving cargo operations could occur. This is puzzling, because there is no reasonable basis for presuming that 4 assumed fatigue-based accidents will exactly conform to the prior decade's breakdown between passenger and cargo operations since FAA acknowledges that fatigue-based accidents are somewhat random in nature.[66] Instead, FAA's high benefits case simply assumes a somewhat larger aircraft with crew deaths rather than injuries. Changing the assumptions to a more realistic size category of the aircraft and factoring in the common circumstances of at least one – and potentially up to five – non-crew passengers occupying seats aboard cargo aircraft, with potential for damage to persons or property on the ground, would significantly change the estimated benefits derived from including cargo operations within the scope of the rule.

[66] Final Rule at 393; Initial Supplemental RIA at 35.

Specific Flaws in FAA's Assessment of Benefits Relating to Cargo Operations

A Lone Accident in Ten Years Provides No Statistical Basis to Predict Future Accidents

FAA claims that the probability of a fatigue-related cargo-only aircraft accident in future years will be "an exact mirror" of the past, as evidenced by the 10-year history from 2001 to 2010. The Final RIA lists as benefits only "the value of *an* averted all-cargo fatal accident."[67] The Interim Supplemental RIA similarly reflects only one accident, even in the "high case."[68] Even accepting for a moment the dubious premise that the only benefit of the Final Rule relates to flight accidents avoided, this FAA cargo accident assumption is based on a statistically insignificant sample size of *one such accident in ten years*. Using this period as the database for establishing accident frequencies fosters a bias that is characteristic of estimates developed from small samples. Further, using these data to establish the high case fails to take into account the acknowledged nature of fatigue-related

[67] Final Rule RIA at 35 n.20 (emphasis added). *See also* Final Rule at 332 n.1 (one averted all-cargo accident).

[68] Interestingly, although FAA based the *number* of projected fatigue-related accidents on a review of accidents in the past *ten* years, when it considered at the *types* of fatigue-related accidents, FAA reviewed accident records over the previous *twenty* years where fatigue was a factor. Final Rule RIA at 26, Initial Supplemental RIA at 30.The agency failed to categorize a fatal accident involving a ferry flight (the movement of an empty aircraft to the starting point for its next revenue-producing flight) as a cargo-related flight, despite the fact that the fatigue that contributed to the accident had been caused by a previous *cargo* flight operated by the same crew. FAA characterized the fatigue-inducing flight operation as a "demanding round trip flight to Europe that crossed multiple time zones . . . [and] involved multiple legs flown at night following daytime rest periods that caused the flightcrew to experience circadian rhythm disruption." Final Rule at 334; Final Rule RIA at 11–13, 72–73. As the NTSB recognized, however, this was "a regular cargo flight from Germany." Nat'l Transp. Safety Bd., Aircraft Accident Report: Uncontrolled Collision with Terrain, Air Transport Int'l, Douglas DC-8-63, N782AL, Kansas City Int'l Airport, Kansas City, Missouri, Feb. 16, 1991 2 (Aug. 30, 1995) ("NTSB Kansas City Accident Report") (attached as Exhibit 8). This highlights the need to consider the fatigue-inducing factors that are prevalent in cargo operations, in both reviewing accident history and predicting future accidents.

air-cargo accidents—that their frequency is random and uncertain, a fact that FAA recognizes elsewhere in the RIA.[69]

The level of air traffic is expected to continue to increase over the next ten years. NextGen is expected to remedy some of the capacity and delay problems characteristic of the current air traffic control system and enable denser air traffic at airports while ensuring acceptable safety levels.[70] Pilot alertness is critical to successful take-offs, approaches and landings, which is evidenced by the 20-year history of fatigue-related accidents. Despite the safety benefits that are expected to accompany NextGen and other technological advancements, it remains uncertain how effective it will be in a dense operating environment where avoiding pilot fatigue maybe even more critical than under current airspace conditions.

FAA's assertion that the benefit for cargo operations is only the prevention of a single accident (because only one such accident occurred in the past ten years)[71] is

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[69] Initial Supplemental RIA at 35.

[70] The Next Generation Air Transportation System (NextGen) is the name given to a new National Airspace System due for implementation across the United States in stages between 2012 and 2025. NextGen proposes to transform America's air traffic control system from an aging ground-based system to a satellite-based system. GPS technology will be used to shorten routes, save time and fuel, reduce traffic delays, increase capacity, and permit controllers to monitor and manage aircraft with greater safety margins. Planes will be able to fly closer together, take more direct routes and avoid delays caused by airport "stacking" as planes wait for an open runway. To implement this, the FAA will undertake a wide-ranging transformation of the entire United States air transportation system. This transformation has the aim of reducing gridlock, both in the sky and at the airports. In 2003, The United States Congress established the Joint Planning and Development Office (JPDO) to plan and coordinate the development of NextGen.

[71] "[T]he cargo-only base case estimate uses historical events to determine the preventable accident benefits for the future benefits. There was one air cargo accident during the ten-year analysis period, which occurred July 26, 2002. In this accident three crewmembers were seriously injured and the hull and cargo were destroyed. Thus, the benefit of preventing such an accident in the future consists of averting serious injury to three pilots, the value of the hull and the cargo, and the public and private cost of the accident investigation." Initial Supplemental RIA at p. 40. This simplistic "analysis" does not reflect OMB guidance on addressing uncertainties in the future through a range of plausible values for benefits. OMB Guidance at 14. *See also* FAA Guidance at 3-9.

surprisingly rudimentary. It assumes a static industry, when it is well-known that the aviation industry is very dynamic. Of particular relevance to this rulemaking is that the growth in the integrated freight sector is largely expected to come from growth in international operations[72] – exactly those operations that involve extensive back-of-the-clock, multiple time zone flying.

Basing such an important decision as the exclusion of cargo operations from the scope of the Final Rule based solely on the simplistic assumption that the only benefit of including cargo operations would be avoidance of a single flight accident, without any consideration of

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[72] Both FedEx and UPS have experienced significant growth in their international shipping services. From 2006 to 2011, FedEx's international delivery business increased by 46% (compared with a 14% increase in its domestic delivery business). *See* Eric Bleeker, Can Exploding Overseas Sales Fuel FedEx's Growth?, The Motley Fool, http://www.dailyfinance.com/2012/03/19/can-exploding-overseas-sales-fuel-fedexs-growth/ (Mar. 19, 2012) (attached as Exhibit 9). Over a similar period, from 2007 to 2011, the revenues from UPS's international delivery business increased by 19 % (as compared with a 2% increase in its domestic delivery business. *See* UPS Drives Growth with International Deliveries, MSN Money, http://money.msn.com/top-stocks/post.aspx?post=f1130b80-0076-4a02-a021-8c1164a2f125 (Dec. 14, 2012) (attached as Exhibit 10).

Although the recent global economic downturn has slowed the companies' growth, *see* FedEx Lowers Forecast, Citing Weak Economy, New York Times, http://www.nytimes.com/2012/09/19/business/fedex-lowers-forecast-citing-weak-economy.html?_r=1& (Sept. 18, 2012) (attached as Exhibit 11), both have continued to expand their international delivery capacities.
FedEx is focusing on "the long-term expansion of [its] international presence;" in 2012 alone it opened delivery stations in Europe and Africa, and it acquired transport companies in Mexico, Poland, France, and Brazil. *See* FedEx Corporation, Form 10-K at 6, 9 (May 31, 2012) (attached as Exhibit 12). In order to expand its Asian operations, FedEx plans to acquire 22 new Boeing 777F aircraft by 2014, and an additional 16 by 2020. *See* FedEx Flies to $114 on International Growth, Forbes, http://www.forbes.com/sites/greatspeculations/2011/08/16/fedex-flies-to-114-on-international-growth/ (August 16, 2011) (attached as Exhibit 13).

Expanding international business is also "a catalyst for UPS's growth." United Parcel Service, Inc., Form 10-K at 2 (Dec. 31, 2011) (attached as Exhibit 14). As a result of that growth, UPS is expanding its main European air hub by 70%, and it has opened an air hub in Shenzhen, China. *Id*. at 6. It has also announced the creation of a new international express freight service, which will significantly expand its air cargo operations. *See* New UPS Worldwide Express Freight Service Offers Faster International Shipping in More Lanes (Canada), http://pressroom.ups.com/Press+Releases/Archive/2013/Q1/New+UPS+Worldwide+Express+Freight+Service+Offers+Faster+International+Shipping+in+More+Lanes+(Canada) (Jan. 2, 2013) (attached as Exhibit 15).

several likely categories of other potential benefits and without performing sensitivity analyses on key variables, does not appear to comply with the standards for conducting a BCA, such as (1) Executive Order 13563 Sec. 1(c), which requires agencies to attempt to quantify all costs and benefits and consider qualitatively those that are difficult to quantify; (2) OMB's guidance (see pp. 4, 12-13); or (3) FAA's own BCA guidance (see p. 2-5)**.**

To Remedy These Deficiencies, FAA Should Address the Following Issues:

Avoided Costs Per Accident

Hull Value

In the Final Rule Regulatory Impact Analysis, FAA's total estimate of the potential benefits from including cargo operations in the Final Rule was limited to avoiding the costs of one fatal accident over a ten year period, with the loss of two to four flightcrew members and the aircraft hull (totaling $20.35 million to $32.55 million).[73] In December 2012, a year later, FAA "refined" this analysis by positing that the aircraft that would be lost would be one is unlikely to be in the cargo fleet during the benefit forecast period. The result of this "refinement" was to reduce the assumed lost hull value from $8.2 to $1.8 million. In addition, FAA changed its assumptions of the accident by positing that the three member crew would merely be injured, rather than lost.[74] Thus, total benefits, in the form of avoided losses, were assumed to be only $5.5 million for the "base case."[75] This "analysis" simply repeats the exact facts of the 1992 Fedex Everglades crash. In the "high case," FAA assumed a slightly larger aircraft – which would actually be flying in the benefit forecast

[73] Final Rule RIA at 13 n.3 and 35 n.20. *See also* Final Rule at 332 n.1.

[74] Initial Supplemental RIA at 42.

[75] *Id*.

period – and further assumed that the crew would be killed, rather than simply injured. This resulted in a total of $31.4 million in assumed benefits.

Because a B-727 was involved in the most recent cargo crash, FAA presumes that a B-727 will be involved in the next cargo crash – despite the fact that B-727 aircraft will likely not even be flown by all-cargo carriers in the 2014-2023 timeframe.[76] Thus, FAA's assumption that an essentially valueless aircraft would be involved in an accident results in a grossly underestimated lost hull value for aircraft involved in a serious accident.

The fallacy of FAA's decision should have been readily apparent to the agency from the fact that the agency used $69 million as the market value of a typical aircraft for purposes of determining the downtime cost of retrofitting the aircraft fleet with adequate rest facilities.[77] Thus, FAA used a value of *38 times* the value of the assumed cargo crash when evaluating costs. Because the objective of both analyses is to determine the value of an aircraft that would be taken out of service (whether due to an accident or some other reason), FAA's use of a "hull value" that is 2.6% of the aircraft value used in assessing costs[78] in the same BCA is arbitrary and capricious.[79] Such inconsistencies skew the

[76] Figures 1 and 2 in Exhibit 16 show the rapid curtailment in B-727 air freight operations that has occurred since the crash of FedEx 1478 in 2002. The sharp decline of B-727 cargo operation in the U.S. reflects the high fuel consumption of this three-engine aircraft and higher labor costs associated with the three-person minimum crew size. In addition, B-727 aircraft will have been in use from 30 to 50 years by 2014 and 40 to 60 years by the end of the benefit forecast period in 2023.

[77] Initial Supplemental RIA at 80.

[78] *Compare* Initial Supplemental RIA at 42 (using a hull value of $1.8 million for calculating the cargo-only base case estimate) *with* Initial Supplemental RIA at 80 (using a value of $69 million for calculating costs of "downtime"). $1.8 \div 69 = .026$.

[79] In the Final Rule RIA, FAA ascribed $8.15 million for the hull replacement value for a lost cargo aircraft. See Final Rule at 394). This is 12% of the estimated $69 million market value used to estimate the cost of the loss of use of an aircraft. But after a year, FAA "refined" its analysis to assert that the lost value would be $1.8 million for a lost B-727 aircraft. Initial Supplemental RIA at 42. It is remarkable that FAA's "refined" analysis lowered the value of avoiding an accident by positing an aircraft that will be out of the fleet by the forecast benefits period.

relative costs and benefits and does not conform to accepted norms for preparing BCAs. The appropriate aircraft for the analysis is as follows: for the lower bound it is an average of the narrow body aircraft in the fleet expected to be in service during the benefit period, which is 73,930 lbs average capacity B-757 with $11M hull value; for the upper bound, it is a 248,300-lb capacity B-747 with a $60.6M hull value.[80] The lack of care demonstrated by FAA in "correcting" its earlier mistakes calls into question the integrity of FAA's analysis in the Initial Supplemental RIA.

Value of Cargo Lost in an Accident

FAA underestimated the value of cargo that would be lost in a serious accident. FAA stated that it "is unaware of published estimates for the value of air cargo."[81] The agency apparently used its lack of awareness as a justification to employ a generic valuation of air freight (based on a value per ton of $87,082).[82] As a result, FAA stated that, "We estimate the average value of cargo on a B727-200F to be $2.7 million."[83]

As an initial matter, even accepting FAA's methodology for a moment, the low case scenario should not be based on a B-727 aircraft, which will be virtually absent from the cargo fleet by 2014, but rather a B-757 aircraft, which has been replacing the B-727. FAA

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[80] IPA's analysis of cargo and hull value is attached at Exhibit 17.

[81] Initial Supplemental RIA at 41.

[82] [W]e derived the average value per ton of air cargo by assessing the commodity flow value and commodity flow weight of goods transported by air from the 2007 Freight Analysis Framework (FAF) Survey." *Id*. FAA explained that this information was "based on Freight Analysis Framework 2007, a joint survey conducted by the Census Bureau and BTS and updated every 5 years. *Id*. at n. 31 (citing http://www.bts.gov/publications/commodity_flow_survey/2007/state_summaries/).

[83] "Inflation adjusted average cargo value per ton of $87,082 was calculated by dividing the origin-destination averaged airfreight value of commodities by the corresponding averaged airfreight weight of shipment, with inflation rate based upon the Gross Domestic Product deflator. The average cargo value of $2.7 million was calculated by multiplying the maximum cargo weight capacity of a B727-200F aircraft (31 tons) by the average cargo value per ton ($87,082)." *Id*. at 41.

used the B-757 to calculate its "high case" for cargo value of $3.7 million.[84] However, IPA has determined that the average cargo value of a B-757 is actually $3.2 million, and so we use that figure. Moreover, the average hull value of a B-757 in the cargo fleet is $11 million, rather than the $15.2 million value used by FAA.[85] Thus, FAA's "high case" is actually closer to the "low case" for determining hull value. Under the FAA's methodology, the high case should actually be a B-747, with a 248,300 lb. payload, which would result cargo value of approximately $10.8 million[86] and a hull value of $60.6 million.

However, contrary to FAA's statement, there is at least one published report, readily available to the FAA, that describes the value of air cargo in the overnight package industry. The NTSB Aircraft Accident Report concerning FedEx Flight 1406 at Newburgh, NY [87] stated that "most of the cargo was destroyed by fire and smoke and by the firefighting agent applied during the emergency response operation," and that the "insurance estimates of the value of the destroyed cargo totaled about ***$300 million***."[88]

Admittedly, Flight 1406 involved a large aircraft, a DC-10-10, which is not necessarily representative of the fleet to be flown in the 2014-2023 timeframe. However, the payload of Flight 1406 can be proportionately downsized to a common, smaller aircraft that will be in the fleet, such as the B-757, which has a carrying capacity that is 42% and of

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[84] "[T]he complete loss of the cargo carried is valued at about $3.7 million. The cargo value is determined based on the maximum cargo weight capacity of 42.9 tons for a B757-200F aircraft, multiplied by an average cargo value per ton of $87,081." *Id.* at 43.

[85] Initial Supplemental RIA at 42-43.

[86] (248,300/2000) x $87,082 = $10,811,230.

[87] This was not a fatigue-related accident. However, IPA cites it only for valuation of the cargo aboard the FedEx aircraft; for this purpose the cause of the accident is irrelevant.

[88] Nat'l Transp. Safety Bd., Aircraft Accident Report: In-Flight Fire/Emergency Landing, Federal Express Flight 1406, Douglas DC-1 0-10, N68055, Newburgh, New York, Sept. 5, 1996 11 (July 22, 1998) (emphasis added) (attached as Exhibit 18).

that of the DC-11. Applying these percentages would result in a cargo value of approximately $125 million for a B-757. Even assuming some margin for error, this is between one and two orders of magnitude above FAA's figure of $2.7 million, which it derived simply by multiplying a generic air freight value per ton by the payload capacity of a B-727 that will not be flying over the next ten-year period. The publicly available information from the NTSB report should have been considered by FAA and it should certainly be considered by the agency now as evidence that its estimated benefits for avoiding destruction of cargo may be very low.

It is not surprising that the overnight package delivery airlines carry high value cargo on board their aircraft. In this very docket, UPS stated that "UPS's typical cargo often includes critically needed medical supplies and pharmaceuticals,"[89] and "sophisticated, high-value industrial components used to operate critical infrastructure such as power stations and water treatment plants."[90] Moreover, express overnight packages often include high value and/or perishable cargo such as computer and electronic equipment and components,

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[89] UPS's assertion that its planes often carry critically-needed medical supplies is reinforced by the fact that it has expended considerable resources in recent year to construct refrigerated facilities at its main cargo facilities to preserve and maintain the integrity of such life-saving cargo. Moreover, this is a growing sector. "With more temperature-sensitive healthcare products entering the market and major growth forecasted, pharmaceutical and biotech companies are turning to UPS for temperature-sensitive storage, distribution and transportation services . . . To help customers manage the entire supply chain process, UPS offers a broad range of solutions. Such solutions include:

- Shipment refrigeration intervention services
- Dry ice and replenishment services for drugs, medical samples and biological products
- Around-the-clock monitoring and track-and-trace services
- UPS Packaging Lab, which offers temperature and humidity chambers for testing packaging of temperature-sensitive products."

See United Parcel Service, UPS Temperature-Sensitive Solutions for Healthcare, http://pressroom.ups.com/Fact+Sheets/ci.UPS+Temperature-Sensitive+Solutions+for+Healthcare.print (attached as Exhibit 19).

[90] UPS Comments on Flightcrew Member Duty and Rest Requirements 19, 5 (Nov. 15, 2010) (FAA Dckt. No. FAA-2009-1093-1899).

telecommunications equipment, vital organs for transplants, vaccines, pharmaceuticals and medical equipment and supplies, perishables, and business and banking documents.

At an earlier point in this rulemaking, in a draft of the Final Rule, FAA stated that "the costs that are imposed by this rule are justified by the associated benefits of reducing the risk that passengers *and/or critical air deliveries* will be involved in an accident."[91] At OIRA's suggestion, however, the italicized language was deleted, apparently to reflect cargo's exclusion from the Final Rule.[92] That does not explain, however, why FAA did not consider as a benefit the value of avoiding the destruction of "high-value components," in an air crash or the economic consequences of such critical cargo not being delivered on time (or having to be replaced or rebuilt), due to a fatigue-caused accident.

FAA Did Not Consider Many Potential Benefits of Applying the Final Rule to Cargo Operations

There are Often Passengers Aboard Cargo Aircraft

Non-crew occupants in cargo-only aircraft were not considered in the Interim Supplemental RIA. This is not an accurate depiction of historic cargo-only operations, and is an understatement of what is anticipated in the future due to explicit policy decisions of companies such as UPS. Generally, there has been at least one non-crew occupant on cargo-only flights in the recent past.[93] In the current fleet for UPS, for instance, the number of jumpseats on board for non-revenue passengers ranges from 4 (for the 757 and 767) to 5 (for the A300 and the MD-11) to 5-10 (for the 747). UPS policy is that the jumpseats may

[91] EO 12866 Compliance at 262 (emphasis added).

[92] *Id*.; Final Rule at 392.

[93] In the "base case" scenario, FAA's mistake in overlooking passengers is offset by the fact that it assumed a 3-person crew instead of a 2-person crew. However, in the high case scenario, it would be reasonable to assume more than one passenger, and FAA assumes a two-person crew. Thus, FAA's over-estimate of the number of crew members in the "base case" does not offset a reasonable estimate of numbers of passengers in the high case.

be used by a variety of persons designated by the company, including deadheading crews, mechanics, loaders, animal handlers, company officials and employees, military couriers, and FAA and NTSB officials. In fact, the NTSB chair was recently a passenger on a UPS international flight. It is anticipated that future cargo aircraft occupants will range from one to five passengers, plus the crew. For 2-5 passengers, the increased benefits of avoiding fatalities would range from $12.4 million to $31 million, using FAA's valuation of $6.2 million per life.

FAA Did Not Consider the Possibility of Damage, Injuries, or Fatalities on the Ground

The potential for ground damage and fatalities resulting from a cargo aircraft accident is not factored into the FAA benefit analysis. The 1992 crash of an El Al cargo aircraft in Amsterdam is an example of serious ground damage that can occur with a cargo airplane crash. Three crew, one occupant, and 43 people on the ground were killed as the plane slammed into a large 11-floor apartment complex while on final approach.[94] Another 26 people on the ground suffered injuries.[95] Fortunately, many people were not home on the evening of the crash, most likely due to the nice weather. Otherwise, there may have been more fatalities, as originally estimated by the Dutch government.

[94] *Two Engines Separate from the Right Wind and Result in Loss of Control and Crash of Boeing 747 Freighter*, Flight Safety Foundation, 53 Accident Prevention 1 (Jan. 1996).

[95] *Id.*

El Al Cargo Aircraft Crash in Amsterdam, October 1992

While this accident was not fatigue induced, it illustrates the potential damage a cargo aircraft can inflict on civilian population centers, regardless of the cause of the crash. The El Al cargo flight crashed 10 miles from the airport while on final approach. The fatigued crew operating the FedEx Tallahassee aircraft crashed 2 miles from the airport and was also on final approach.

Similarly, an American Airlines flight crashed into Queens, NY in November 2001 shortly after takeoff.[96] In addition to the on-board casualties, there were 5 ground fatalities, and it appears that 5-7 homes were destroyed. (Photo of crash site below).

[96] Nat'l Transp. Safety Bd., Aircraft Accident Report: In-Flight Separation of Vertical Stabilizer, American Airlines Flight 587, Airbus Industries A300-605R, N14053, Belle Harbor, New York, November 12, 2001 (Oct. 26, 2004) (attached at Exhibit 20). This was a passenger aircraft operation. IPA cites it simply for the fact that aircraft accidents on takeoff or landing do not always occur on airport property, and, in fact, sometimes cause deaths and damage to structures on the ground.

Ignoring the possibility of averting this type of fatigue-related accident disregards the random nature of accidents and their potential for catastrophic consequences and creates an unrealistic limit to the benefits to be realized by applying the Final Rule to cargo-only operations.[97] Accordingly, FAA should examine a reasonable range of fatigue-related accidents that extend beyond the so-called "high case" considered in the RIA.

[97] The need to at least consider potential catastrophic scenarios is illustrated by FAA's history regarding security-related regulations. After the International Civil Aviation Organization ("ICAO") adopted cockpit door penetration resistance design provisions in 1997, FAA set up a working group to adopt changes to reconcile its regulations with these international standards. *See* Notice of New Task Assignment for the Aviation Rulemaking Advisory Committee (ARAC), 64 Fed. Reg. 57921 (Oct. 27, 1999). Airlines adamantly opposed this measure, citing the excessive costs of retrofitting commercial passenger aircraft with hardened cockpit doors. National Commission on Terrorist Attacks upon the United States, The 9/11 Commission Report 84 n.56 & 57 (2004) (citing Memorandum for the Record for the 9/11 Commission Report regarding interview with Leo Boivin, former Director, FAA Special Assessments Unit (Sept. 17, 2003)). As a result, in 2001 before the terrorist attacks, FAA contemplated limiting changes to new aircraft only. *Id.* On September 11, 2001, the U.S. suffered the worst security breach in civil aviation history – the virtually simultaneous hijacking of 4 airliners by terrorists who ran three of the planes into the largest office buildings in the country, killing hundreds in the aircraft and thousands of persons on the ground, destroying four aircraft and two of the buildings, causing extensive damage to the third building, shutting down the entire aviation system for several days, and throwing our economy into a tailspin.

Within four months after September 11, 2001, FAA moved to unilaterally implement rules requiring hardened cockpit doors on all aircraft, including retrofitting operational aircraft. FAA's cost-benefit analysis reflected a new appreciation for the benefits arising from such safety measures, stating that it "cannot provide a reasonable quantitative estimate of benefits because the extremely high benefits

Because accidents are somewhat random, and because fatigue is especially a concern during take-off and landing, the BCA high case should account for the possibility that a fatigue-based crash could occur at a point along a cargo airplane's arrival or departure flight path. Even in the base case study of the FedEx Tallahassee incident, FAA could have, but did not, discuss physical damage to the forested area or loss of use of the property for income producing purposes. A wide range of possibilities of ground damage can result from a fatigue induced aircraft accident. The consequences of an accident elsewhere along the arrival or departure flight path could include substantial loss of life, injury, and property loss or damage on the ground as well as to the flight crew, passengers, cargo and aircraft. Such an accident is within the realm of reasonable possibility and should be used as the high or upper bounding case. Depending on the geographic site of the crash, the ground damage cost alone could easily surpass the FAA's 10 year final rule cost estimates.

Fatigue-induced aircraft accidents have predominantly occured during the takeoff and landing phases of flight where the aircraft is in close proximity to airports and population centers. Of particular importance in this case, the three U.S. integrated freight carriers operate exclusively in the highest population centers and then transport the onboard freight to lower population areas via truck or rail. The three integrated freight air carriers also account for a preponderance (89%) of the total U.S. air cargo industry takeoffs and

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that are involved in avoiding another similar attack . . . will most likely be in the tens of billions of dollars, a figure that overshadows any cost associated with this series of rules." Security Considerations in the Design of the Flightdeck on Transport Category Airplanes, 67 Fed. Reg. 2118, 2125 (Jan. 15, 2002). Prior to 9/11, if someone had suggested avoiding this calamity as a potential benefit of hardening the cockpit doors, it would have been dismissed as preposterous. Yet it happened, notwithstanding the fact that it had not happened in the past. In order to provide useful information for regulators to consider, BCA professionals should anticipate potential future disasters that could be avoided, rather than only focusing on avoidance of problems that have already occurred.

landings.[98] On a daily basis, the integrated freight carriers operate flights into and out of 50 of the highest populated 50 Metropolitan Statistical Areas (MSAs), 93 of the 100 most populous U.S. cities, and 75 of the top 100 MSAs.[99] Consequently, cargo aircraft are operated in close proximity to over to 210,000,000 people as they take off and land at airports within the U.S. MSA's. Since many fatigue related accidents have occurred at low altitude and on short final approach, the population located in close proximity to airports is particular at risk for errors made by fatigued pilots (especially cargo pilots operating during the Window of Circadian Low and in night conditions).

According to Boeing's Statistical Summary (July 2012), there were 13 fatal cargo commercial jet accidents worldwide between 2002 and 2011. There were a total of 44 onboard fatalities and 72 fatalities external to the aircraft in these 13 incidents.[100] This averages out to 5.5 external fatalities for each serious cargo aircraft accident. At a minimum, the FAA benefit estimates should be adjusted to include the possibility of ground fatalities resulting from a fatigue induced cargo aircraft crash. Based on the 5.5 average number of external fatalities per accident, $34.1M could be an appropriate number to use in the low case. The high case could use a range of numbers, but the mid-point between the actual highest known deaths on the ground from a cargo crash and the mean of 5.5 would be 24; the resulting value of lives saved by avoiding such an accident would be $148.8 M. FAA could perform a sensitivity test which would determine the value of lives saved along a continuum of potential fatalities and this should be included in the RIA.

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[98] DOT Form 41 data.

[99] *See* MSA Cargo Map (attached at Exhibit 21).

[100] These accidents were not all fatigue-related; nonetheless, they illustrate the type of grand damage that can occur from a cargo plane crash.

FAA should also make some attempt to consider potential property damage on the ground, which could be as serious as a large building, as in the Amsterdam crash, homes as in the Queens, N.Y. crash, or smaller, unoccupied structures, as well other facilities and vehicles.

The RIA, by not considering a range of plausible accidents and not applying sensitivity analysis to the random and uncertain event of an aircraft accident and its consequences, fails to "use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible"[101] and thus, fails to comply with the Executive Order. The RIA fails a test of cost realism by ignoring the possibility of a ground impact crash in a populated area that typically surrounds airports—the potential catastrophic consequences of such an accident are evident from the Amsterdam crash. Accordingly, the RIA does not demonstrate the "maximum net benefits" that would accompany the final rule as required by the Executive Order.

Lost Shipping Charges

In addition to the loss of the value of the cargo and the lost opportunity for the intended recipient, FAA should have calculated the loss of the shipping charges to the overnight air cargo company. Fees paid for delivery must be refunded for goods lost and not delivered. This is a real economic loss resulting from an accident that should be readily ascertained by FAA. Cargo companies that have provided extensive detail to FAA for use on the cost side of the BCA could provide FAA with information on the average revenue for a range of cargo flights.

[101] EO 13563 at § 1(c).

Value of timely receipt of cargo

FAA failed to consider *at all*, the lost opportunity costs for the intended recipients of critical overnight packages by integrated freight operators. This category includes avoiding the delay in delivering critical documents and equipment or the need to reconstruct specialized items that would have been destroyed in the accident. The reason that people and companies pay to have documents, parts, equipment and medical supplies shipped overnight, rather than by a slower means of conveyance, is because there is particular value in their being delivered quickly, by the appointed time. Whether they are critical documents related to significant business or legal transactions; urgently needed medical supplies or drugs; or parts or equipment needed for the smooth functioning of offices, manufacturing plants, and other facilities under just-in-time inventory systems, there are real economic consequences if the shipped items do not arrive on time, much less if they never arrive.

FAA did not provide any evidence that it attempted to calculate the financial impact of the failure of such critical items to reach their intended destinations, whether needed to keep a power station or plant in operation, to enable a transaction to move forward, or to save lives. Obviously, the failure to deliver these important items, due to a plane crash, can have serious economic, life-or-death or other consequences. As a specific example of the unusual, but high-value cargo that may be flown on integrated freight flights, in the 2002 FedEx 1478 crash in the Florida Everglades cited by FAA, qualifying paperwork for several Florida state political candidates was destroyed. The submission deadline was the same day as the accident. As a result of this crash, the Florida Governor was forced to declare a state of emergency to extend the deadline.

The lost opportunity value of the items that would never be delivered is very significant, and FAA should have made an effort to ascertain these values. Both UPS and FedEx routinely transport vital documents, irreplaceable historical artifacts, and other items of great value by air. Simply declining any attempt at quantifying or otherwise assessing difficult-to-value factors is not an acceptable option under the applicable Executive Orders.[102]

Determining the economic value of such cargo is not a simple matter of using the average value per ton of air cargo. Expedited cargo should be assigned a higher value consistent with the economic principles applied to value time, similar to that used when travelers are delayed and delays for business travelers are weighted more than delays for leisure travelers.

Runway Closure Due to Accident

Even on-airport accidents that do not include on-ground loss of life can have significant ancillary impacts, such as tying up a runway for hours or days until the wreckage and any fuel spills can be cleaned up. For instance, in the 2009 FedEx accident at Narita International Airport in Tokyo, Japan, reports stated that traffic had to be diverted to other airports when the airport's longest runway was tied up with the wreckage.[103] FAA can readily find out from the appropriate authorities how long the runway was out of commission. FAA is well aware of the propagating effects and costs associated with air traffic delays, diversions, and cancellations. The agency can also ascertain the nature of the air traffic control and airline operational adjustments that had to be made including

[102] *See supra*, pp. 12-13 (discussion of Executive Orders).

[103] Hiroko Tabuchi and Mark McDonald, *Pilots Killed in Crash of Cargo Plane in Japan*, New York Times (Mar. 22, 2009), available at http://www.nytimes.com/2009/03/23/world/asia/23japan.html (attached as Exhibit 22).

rerouting, re-ticketing, and passenger and cargo delays in other accidents, in order to develop a reasonable range of estimates for the benefit of avoiding such disruptions, FAA should do this.

Loss of Use of Aircraft Until Replacement is Put into Service

Avoiding a fatigue-based accident has other benefits relating to the continued revenue generating use of an aircraft that would have been lost in the accident. Once an aircraft is lost, there are likely to be some additional costs incurred by cargo carriers to re-schedule and recover operations in order to maintain the "normal" cargo flow until a replacement aircraft is obtained. Avoiding these additional costs is another benefit realized from preventing a fatigue-based cargo aircraft accident that is not addressed in the RIA. While it may be difficult to estimate these benefits, FAA is obliged to attempt to do so or at least identify them and address them qualitatively.[104] The agency made extensive efforts to obtain and analyze information from the cargo carriers about costs of compliance, and FAA should make a similar effort to obtain and understand information from the carriers related to potential benefits of implementing the rule.

For example, FAA included as a cost, "loss of service" for aircraft that are taken out of service in order to retrofit them with rest facilities so as to comply with the Final Rule.[105] FAA made no similar attempt to include, as a benefit, *avoiding* the loss of service for aircraft that would have been destroyed or damaged in fatigue-related accidents or incidents before they are replaced or repaired.

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[104] EO 12866 at § 1(a).

[105] Final Rule RIA at 65, Initial Supplemental RIA at 80. As describe elsewhere, FAA made serious errors in its estimation of such costs, but those errors do not change the fact that FAA undertook the effort to identify and quantify such costs.

FAA was able to obtain extensive data from cargo carriers with respect to costs, e.g., relating to scheduling costs or average profits/flight, but apparently did not apply this information in attempting to quantify benefits. The apparent disparity in the level of effort to determine costs versus benefits does not evidence the required evenhanded, professional effort to prepare an objective BCA that meets FAA's obligations and responsibilities under the applicable executive orders and OMB and FAA guidance, and FAA should remedy this deficiency.

Environmental Clean-up and/or Damage

FAA did not attempt to calculate avoided adverse environmental impacts from the release of aircraft fuel and hazardous materials carried on board all-cargo aircraft involved in an accident. FAA stated that "There is no historical basis to project any impact, as DOT reporting indicates there were only two "hazmat" accidents involving aviation in the last ten years and there was no cost to the public from those accidents."[106] First, "cost to the public" is not the standard. Even if an avoided cost is one that a carrier would have had to bear, it is considered a benefit, just as FAA counts costs imposed only on carriers on the other side of the ledger. Second, even if the one cargo accident in the last ten years did not involve clean-up costs, they should be considered in the high benefits case. And, in fact, one of the fatigue-related accidents FAA reviewed in its twenty year analysis involved some hazardous waste spillage that required clean-up. According to the NTSB report,[107] environmental clean-up costs due to a fuel spill at an accident at Kansas City amounted to $474,000 in

[106] Initial Supplemental RIA at 43, n. 37.

[107] NTSB Kansas City Accident Report 25 (attached as Exhibit 8).

1995.[108] Inflated using the GDP implicit price deflator, this would amount to approximately $0.7 million in 2012 dollars.

Also, while not a fatigue-based accident, in 2002, a Pennsylvania State Department of Environmental Protection spokeswoman said it cost United Airlines $850,000 for the environmental investigation and remediation of jet "A" fuel spilled at the site of the crash of United Airlines Flight 93 crash site near Shanksville.[109] Inflated using the GDP implicit price deflator for 10 years, this would amount to over $1 million in 2012 dollars. Avoiding the potential for a fuel spill should at least be considered in the high case for benefits related to avoiding a fatigue-related cargo aircraft accident.

FAA Failed to Account for Benefits It Identified in the Rulemaking Process

Executive Order 13563 requires that qualitative benefits be considered. FAA followed this guidance in the NPRM, by including a section entitled Additional Benefits immediately after the quantitative comparison of costs and benefits.[110] This section discussed two qualitative benefits, ramp accidents and well rested pilots as problem solvers to cargo accidents. In order to determine that there were sufficient benefits to justify the costs of the proposed rule in the NPRM, where calculated costs ($804 million) *exceeded* the benefits ($463.8 million) by $330 million,[111] FAA relied on "two additional areas of

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[108] In order to calculate a potential level of hazmat cleanup costs for a high case scenario, costs of fuel spills can be gleaned from other accidents as well, whether cargo or passenger flights.

[109] *Crash Site Cleanup Cost $850,000*, Tribune-Review (Sept. 11, 2002), http://triblive.com/x/pittsburghtrib/news/specialreports/oneyearlater/s_90857.html (attached as Exhibit 23) (link is dead but accessible as archived by the Internet Archive on Apr. 30, 2009. Type copy into field at www.archive.org and press button, then select April 30, 2009 snapshot).

[110] FAA Regulatory Impact Analysis for Flightcrew Member Duty and Rest Requirements Notice of Proposed Rulemaking (Sept. 3, 2010), at 68-71 ("NPRM RIA") (FAA Dckt. No. FAA-2009-1093-0019).

[111] Proposed Rule at 55853, 55877–55878. *See also* NPRM RIA at 119–20.

unquantified benefits: preventing minor aircraft damage on the ground,[112] and the value of well-rested pilots as accident preventors and mitigators."[113] However, in the Interim Supplemental RIA, qualitative benefits that are identified receive only cursory mention and are conspicuously dismissed or omitted entirely from the actual BCA section. For example, when evaluating cargo operations, FAA failed to consider the benefits of avoiding any ramp/taxiway accidents.

Ramp/Taxiway Accidents

In the RIA related to the NPRM, FAA acknowledged that ground-based incidents caused by fatigue may cost far more, in the aggregate, than a single flight-based accident,[114] but the combined costs of such accidents are left entirely out of the Initial Supplemental RIA and the Final Rule RIA.[115] FAA acknowledged that "so few of these are investigated in much detail that they tend to be disregarded when looking at new safety regulations."[116] The implication was that FAA would consider such incidents in this rulemaking, and, in fact, it did so in the NPRM and the accompanying RIA. However, it did not carry this commitment forward in the Initial Supplemental RIA.

The benefit of avoiding ramp/taxiway accidents is potentially very great. With respect to overall costs and benefits, FAA determined that "if the rule were to reduce damage by about $600 million over 10 years ($340 million present value) it would break

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[112] These incidents include non-fatal accidents where, for example, two aircraft strike each other's wingtips, or where part of an aircraft strikes a building, ground vehicle, or other equipment.

[113] Proposed Rule at 55878.

[114] "[T]here is a much larger universe of relatively minor accidents that may involve much larger annual dollar losses than the few fatal accidents that do occur." NPRM RIA at 69.

[115] *See generally* Initial Supplemental RIA; Final Rule RIA at 26-36 (benefit analysis).

[116] NPRM RIA at 69.

even in terms of net benefits . . . ."[117] FAA's analysis suggested that the benefits of avoiding ground incidents could be even greater. FAA stated that ground incidents in the U.S. "exceed $3 billion *per year*," and that "the data on when these accidents occur suggest they are more prevalent when the potential for fatigue is greatest."[118] FAA observed that "[i]f even only a few percent of the losses from ground accidents are caused by pilot fatigue, the annual losses are large. Three percent would be $90 million *per year*."[119]

FAA concluded that "[t]hese data suggest that *the scope of accidents/incidents for valuing safety needs to be expanded to account for losses due to ground events where appropriate*."[120] Having relied on the benefits of avoiding the costs of such ground-based incidents to find an acceptable cost-benefit ratio for the NPRM (which included cargo operations), it is incomprehensible that FAA failed to apply such savings in the Supplemental Interim RIA, when considering the costs and benefits of applying the Final Rule to all-cargo operations. The result is that the BCA fails to account for all of the FAA-acknowledged benefits of applying the Final Rule to all-cargo operations. FAA offered no explanation for its apparent decision not to calculate the FAA-acknowledged benefits of avoiding ramp/taxiway accidents which, by FAA's reckoning, are likely to vastly exceed the benefits of avoiding flight-based accidents.

While the avoided costs may be difficult to quantify, disregarding an admittedly large benefit entirely is not an appropriate response for a professional and realistic BCA. The Obama Executive Order states that agencies must attempt to quantify anticipated and

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[117] Proposed Rule at 55878.

[118] NPRM RIA at 69, 70 (emphasis added).

[119] *Id.* at 70 (emphasis added).

[120] *Id.* (emphasis added).

future benefits and costs as accurately as possible and consider qualitatively those that are difficult to quantify.[121] The intent of the FAA guide is to ensure that estimates are as accurate as possible. A rigorous BCA would develop a low and high case for these benefits, based on reasonable, and clearly articulated assumptions, and include a sensitivity analysis to account for potential variations. At the very least, the BCA should include a prominent qualitative discussion of the issue to inform the decision-makers of the unquantifiable benefits so that they may be taken into account in making a final determination.

More alert flight crews (better decision-makers)

In the NPRM RIA, the FAA also recognized the importance of "having well rested (and well-trained) pilots in the cockpit to solve minor problems before they become accidents."[122] FAA also acknowledged "the value of well-rested pilots as accident preventors and mitigators."[123] FAA cited the Miracle on the Hudson (double bird strike disabling both engines) "as an example of how very quick reaction and decision making can avert catastrophes."[124] Because fatigue impairs both cognitive reasoning and physical reactions, it can greatly reduce a pilot's ability to handle sudden adversity successfully. FAA stated that:

> Research and accident history indicate that fatigue can cause pilots to make risky, impulsive decisions, to become fixated on one aspect of a situation, and to react slowly to warnings or signs that an approach should be discontinued…A fatigued pilot might fail to discontinue a flawed approach or might make a risky decision to continue a dangerous approach.[125]

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[121] EO 13563 at § 1(c).

[122] NRPM RIA at 70.

[123] Proposed Rule at 55878.

[124] *Id.*

[125] Initial Supplemental RIA at 32.

FAA concluded that "it is not possible to estimate the impact of increased problem solving capability from fewer fatigued pilots. It is, however, real and significant."[126] Unfortunately, in the Interim Supplemental RIA, FAA apparently made no attempt to account for the safety benefits of well-rested pilots in the cargo context.[127] Again, the applicable Executive Orders and OMB and FAA guidance require agencies to attempt to quantify all benefits that can be quantified, and to consider qualitatively those benefits that cannot be quantified, and FAA should do so.

General Health Benefits of Pilots Not Suffering From Chronic Fatigue

FAA recognizes that there are "substantial, non-quantified health benefits associated with the final rule" as a result of reducing fatigue in pilots,[128] and that "CDC's research shows that chronic fatigue can cause illness and even death."[129] In the Initial Supplemental RIA, FAA also cites CDC's findings that individuals who suffer chronic fatigue are also more likely to contract certain diseases, and even suffer premature death.[130]

However, the RIA makes no attempt to capture these broader benefits of reversing the impact of sleep loss. Improving the quality of life, reduced use of health-care services, and prevention of injuries, illness or death are neither quantified nor presented in a manner that highlights their qualitative benefits so that they may be considered by decision-makers

[126] NPRM RIA at 71.

[127] FAA did not indicate that it made any effort to quantify the safety benefits of well-rested pilots. Given Congress' express emphasis on safety, it was inappropriate and contrary to applicable guidance for FAA to fail to give any weight to these FAA-identified benefits, even if unquantifiable, in the cargo context. See EO 12866 at § 1(a).

[128] Final Rule at 392.

[129] Final Rule RIA at 7.

[130] Initial Supplemental RIA at 10.

when making a "reasoned determination", as directed by Executive Orders 12866 and 13563 on whether the benefits of the rule justify its cost.

The Interim Supplemental RIA recognized a statement by the Center for Disease Control that "…chronic sleep loss is an under-recognized public health problem that has a cumulative effect on physical and mental health. Sleep loss and sleep disorders can reduce quality of life and productivity, increase use of health-care services, and result in injuries, illness, or deaths."[131] The FAA further noted that "decreasing these costs represents a societal benefit" that "may well exceed the projected costs of the rule when added to our base case estimate."[132] However, in assessing costs and benefits of applying the Final Rule to cargo operations, FAA did not account for the benefits of improved health (and lower health-related costs) of pilots who work less demanding schedules, despite the fact that this was a benefit that the agency acknowledged.[133] FAA attempts to justify excluding those benefits by explaining that they are not related to aviation safety, but this point is off the mark because FAA's BCA purports to assess the "societal benefits" of the rule.[134] Reduced medical problems – and avoiding the attendant medical costs – are societal benefits from protecting cargo pilots from chronic fatigue, as FAA itself had earlier recognized.

Contrary to explicit FAA guidance, the Interim Supplemental RIA offers no attempt to "make reasonable judgments in order to translate the qualitative information into quantitative information."[135] By failing to explicitly identify or provide even a rough-order-

[131] *Id*. at 71.

[132] Final Rule at 392.

[133] Initial Supplemental RIA at 71.

[134] Final Rule at 332.

[135] Economic Analysis of Investment and Regulatory Decisions—Revised Guide, Federal Aviation Administration, Office of Aviation Policy and Plans 6-9 (January 1998), available at

of magnitude quantification of this qualitative benefit of including cargo operations within the scope of the Final Rule, the RIA fails the test of reasonable diligence.

In contrast, in assessing the costs and benefits of the Final Rule to *passenger* operations, FAA considered qualitative benefits of improvements to pilot health and avoiding costs of avoiding ground incidents.[136] These significant factors should be given no less consideration with respect to cargo operations, and FAA should modify the Interim Supplemental RIA accordingly.

In summary, the BCA FAA relied upon does not support the all-cargo exclusion because it failed to (1) accurately estimate benefits it analyzed; (2) estimate other benefits that FAA itself recognized, and (3) account for other obvious public benefits of applying the new rules to all-cargo operations.

FAA Errors in Estimating Potential Costs of Applying the Final Rule to Cargo Operations

General Overstatement of Costs

FAA acknowledges that it has overstated the economic costs of the Final Rule,[137] but it makes no adjustment in its analysis to account for these overstated costs. FAA should undertake an effort to quantify this overestimate, or at the very least, conduct a sensitivity analysis to address this problem. Otherwise, the results of the BCA are unfairly skewed against inclusion of cargo operations within the scope of the Final Rule.

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http://www.faa.gov/regulations_policies/policy_guidance/benefit_cost/ (last visited on Jan. 24, 2013) (attached as Exhibit 4).

[136] Final Rule at 392–93; Final Rule RIA at 13–14. The Initial Supplemental RIA was more vague – it simply states that costs are "somewhat higher than base case benefits estimate but well below the high case estimate." Initial Supplemental RIA at 17.

[137] Initial Supplemental RIA at 68-69.

FAA also states that, "*The FAA believes that carriers will be able to reduce much of the cost* shown in Table 21 [relating to Annual Crew Scheduling Costs]." [138] This is *by far* the largest cost of applying the rule for all-cargo operations. For integrated freight operations conducted by UPS, FedEx, and Airborne, FAA calculates such compliance costs at $32 million/year or $320 million over ten years. For the entire all-cargo category, FAA calculates such costs at $52 million/year or $521 million over ten years.[139] Reducing "much of the cost" of complying with the Final Rule would obviously have a huge impact on the net benefits. However, FAA does not attempt to quantify that savings.[140] In order to prepare a professional BCA and comply with applicable Executive Orders and follow agency guidance, FAA should attempt to quantify this potentially great cost savings, either by directly revising its cost projections or preparing a sensitivity analysis that includes different assumed levels of savings.

FAA has also provided that air carriers may propose alternative ways of achieving an equivalent level of safety through a Fatigue Risk Management System (FRMS). The agency states that:

> Operators might be able to reduce their flight operations costs by developing and implementing a fatigue risk management system (FRMS). . . . Carriers might develop an FRMS program as an alternative to the final rule flightcrew member duty and rest requirements when the crew scheduling cost savings equal or exceed the costs of the FRMS program. Carriers might do this for ultra-long flights, which have flight times over 16 hours.[141]

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[138] *Id.* at 68 (emphasis added).

[139] *See id.* at 68, Table 21, and 75, Table 25.

[140] *Id.* at 68.

[141] *Id.* at 47, n. 41.

Presumably carriers would do so if such measures would interfere less with their operations and/or cost less to implement than adhering to the specific regulatory requirements. FAA has not attempted to quantify these potential cost savings, and they may be difficult to quantify.[142] FAA should develop a rough order-of-magnitude benefit estimate of these cost savings and perform sensitivity analysis to provide decision-makers with a plausible range of savings that implementation of such provisions could produce. By declining to attempt to quantify an acknowledged cost reduction measure, FAA fails its responsibilities under the applicable Executive Orders and agency guidance.[143] At the very least, FAA should prominently mention the potential for such cost reductions in the consideration of costs and benefits as a qualitative factor for decision-makers to consider. IPA would support the use of FRMS to mitigate the costs of implementing the Final Rule for cargo carriers, as long as the unions representing the affected pilots were made an integral part of the process.

FAA Should Reduce its Cost Estimates by Applying Real World Data to Specific Categories of Costs

FAA's Extrapolation of FedEx Data to Other Carriers Leads to Overstating Costs Related to Increased Pilot Duty Hours

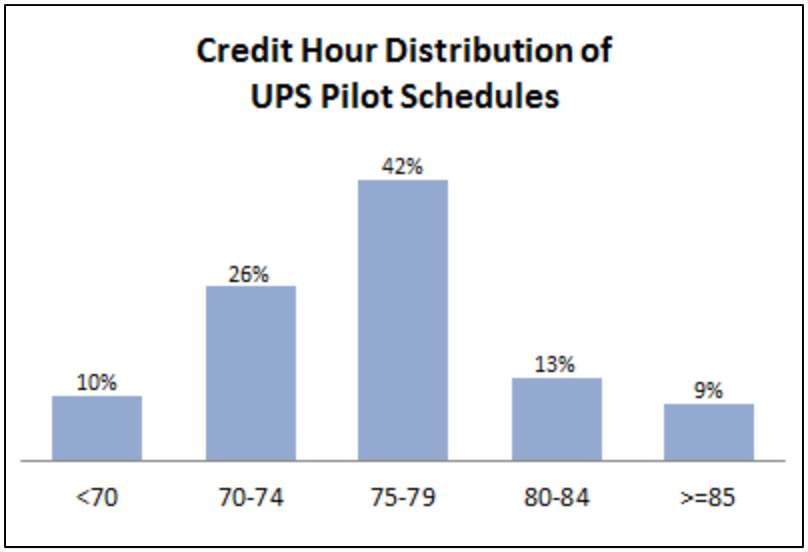
At the heart of the FAA scheduling cost analysis, the FAA only uses the route structure and flying requirements for *one* air cargo carrier and translates those to the rest of the entire industry. Based on the air carrier descriptions and baseline solution numbers in the FAA Supplemental RIA, the airline used for the Freight Integrated, Freight Narrow-body, and Freight Wide-body scheduling cost estimates was Federal Express. Translating the pilot schedules and flying requirements of a single, unique carrier to the rest of the

[142] "FRMS is optional and would only be implemented by an operator if their compliance costs could be reduced as FRMS only provides cost relief. We did not estimate this potential savings as we do not know how many operators would use FRMS and the cost of FRMS has a wide range." *Id.*

[143] EO 12866 at § 1(a)and EO 13563at § 1(c); EO 12866 Guidance, Sec. 6, at 7 (Oct. 12, 1993).

industry, in particular cargo operations at the supplemental carriers, introduces a large margin of error in the analysis results. This is even true for the translation of the Federal Express schedules to the other major freight integrated carrier, UPS. For example, the FAA analysis assumes that all credit hour increases will result in higher costs to the carrier. The FAA crew scheduling modeling analysis estimated a final rule credit hour increase of approximately 1.5% (or, more precisely 1.488%) for freight integrated aircrew members.[144] The FAA then translates this roughly 1.5% credit hour increase to a full 1.5% increase in employee wages. However, this assumption only holds true if the credit hours for all schedules are constructed at or above the collective bargaining agreement minimum guaranteed pay value. At FedEx the minimum guarantee value is 68 hours for a 4-week schedule, and all regular lines normally at or above the 68 hour minimum guarantee. However, at UPS the minimum guarantee is 75 hours for a 4-week period, and 36% of the regular lines credit ***below*** the contractual 75 hour guarantee.

[144] Summary of CrewPairings, Inc. Economic Analysis of Flightcrew Member Duty and Rest Requirements Rulemaking, Figures 15 and 17.



4-Week UPS Pilot Credit Hour Distribution Showing 36% of Flying Schedules Are Below the 75 Hour Pay Guarantee

An analysis of current UPS aircrew member schedules shows that a 1.488% increase in credit hours for each regular line would only result in a 1.047% increase in total carrier credit hour wages.[145] Thus, FAA overestimated the final rule credit hour cost for a UPS lineholder by over 40%. This equates to an over-estimation of approximately $1,400 per UPS lineholder per year, for a total of approximately $2 million in overstated cargo scheduling costs per year, and $20 million over the ten year benefit forecast period.

FAA Overstated Crew Scheduling Costs by Overestimating the Percentage of Active Line Pilots in All-Cargo Operations

Throughout its explanation of its operational scheduling cost analysis, the FAA repeatedly uses terms such as average "hours per flight crew member"[146] or "hours per pilot" or "Average Flightcrew Member Cost." However in the context of its analysis explanation, the FAA is actually referring to costs, averages, and other quantities per

[145] *See* Documentation for IPA Cost Calculations, Guarantee Analysis (attached at Exhibit 24).

[146] *See, e.g.*, Interim Supplemental RIA at 58.

lineholder. The term "lineholder" refers to those pilots at each airline that have a regular flying schedule based on all known flying requirements at that carrier.

In calculating crew scheduling costs of complying with the Final Rule, FAA assumes that the breakdown of pilots at all-cargo operators is 85% lineholders and 15% reserve pilots.[147] FAA's sensitivity analysis of the estimated percentage of reserve pilots ranges only from 12-26%.[148] This assumption results in a gross error in the overall cost results for all airlines. Actual data from FedEx and UPS reflects a much higher percentage of reserves and pilots in other statuses that should not be included in lineholders. For example, there are a significant number of pilots who are assigned schedules built from trips dropped by the primary lineholders due to some sort of scheduling conflict such as vacation or training. These are normally called "Secondary Lines." Secondary line pilots should not be counted in the FAA cost extrapolation because this would result in a double-counting of the costs associated with the rule's implementation.[149]

In addition, pilots assigned to "hot standby" schedules should not be counted in the extrapolation cost calculation for the same reason reserve pilots are not counted.

Moreover, based on well-documented, 6-year statistical data at UPS, approximately 10% of airline pilots, at any given time, are in a non-flying category status, commonly known as "no-bidders." This occurs for a variety of different circumstances, such as medical leave of absence, military duty leave of absence, and long-term upgrade or cross-

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[147] Initial Supplemental RIA at 66-67.

[148] *Id.* at 132-135.

[149] For example, if a primary lineholder drops a trip assignment due to a vacation conflict and a secondary line pilot is assigned that trip, it would be inaccurate to ascribe any increased costs to this crew substitution. The actual operational cost in paid credit hours will simply be transferred from the original lineholder to the secondary line pilot. The same principle applies to hotel and per diem costs -- only one pilot will continue to be paid per diem and only one pilot will continue to occupy the hotel room. From the carrier's point of view, the overall costs do not change.

aircraft training, non-flying special project duties, etc. These percentages may vary by airline, and FAA should examine this. Although these pilots have no ongoing operational cost impact, they are included in the FAA Vital Information Subsystem (VIS) December 2010 total pilot numbers, and hence in the FAA cost estimates for all carriers, cargo or passenger. The following table shows the percentage of lineholders at UPS during the 2010 timeframe and at Federal Express during July 2011.[150]

Airline	Lineholders	Total Pilots	Percentage
Federal Express	2,238	4,299	52.06%
UPS	1,400	2,745	51.00%
Total	**3,630**	**7,044**	**51.65%**

Thus, the number of active, flying line pilots at any given time is roughly 51.65%. Since Federal Express and UPS represent 95% of the freight integrated carrier pilots, the assumed 85% lineholder percentage is a gross overestimate for the freight integrated case. FAA has stated that:

> The total industry final rule cost would be overstated if extrapolation was based on the number of VIS [Vital Information Subsystem] flightcrew members because not all of these flightcrew members are lineholders. . . . [T]he cost estimates are calculated as the change in crew scheduling cost per lineholding flightcrew member.[151]

Thus, an overestimate of the percentage of active line pilots would overstate the industry's costs of compliance. The correct lineholder percentage that should have been used in the FAA cost model is 51.65%. This equates to 3,734 integrated freight lineholders

[150] The UPS data in the table reflects exact line and pilot population counts, averaged for the entire 2010 calendar year. The lineholder count at Federal Express was extracted from an official July 2011 ALPA publication, ALPA FedEx July 2011 SIG Notes, attached at Exhibit 25. The total FedEx pilot population count reflects the December 2010 VIS value used for the Supplemental RIA from Table C.1 (4,227) plus the number of FedEx pilots hired between January and July 2011 (72). The July 2011 FedEx regular line count data is the closest information the IPA has available to the FAA 2010 RIA analysis measurement period.

[151] *Id.* at 66.

(i.e., 51.65% times 7,230 freight integrated pilots), not 6,146 as assumed in the Supplemental RIA. The 3,734 lineholders times the estimated $5,176 annual cost per lineholder equals a total annual freight integrated cost of $19.33 million per year, whereas FAA estimated that integrated freight carriers' crew scheduling costs would be $32 million per year.[152] IPA calculates that FAA's failure to accurately determine the actual breakdown of line pilots and reserves added approximately $12.67 million per year in unjustified costs for *integrated freight carriers* – and approximately $127 million over ten years. Thus, the total nominal freight integrated scheduling costs associated with the rule for the 2014 to 2023 timeframe are $193 million, not $320 million as estimated by FAA, and the agency should adjust its cost estimate accordingly. Note that this calculation does not include the $2.0 million per year excess costs attributable to UPS due to increased credit hours that do not result in exceeding the 75 hour minimum guarantee. Thus, *the net crew scheduling costs for Integrated Freight Operators should be reduced further, to $17.3 million per year* or *$173 million over ten years.*

The IPA does not have access to the exact lineholder numbers for other carriers that would be affected by the FAA's erroneous 85% lineholder assumption. However, nearly every cargo carrier has backup pilots to fill conflicted lineholder trips, hot standby pilots, and pilots that are in short or longer term inactive flying status, and FAA should research this issue more carefully, since it has a huge impact on the crew scheduling cost estimates.

The application of the exact Freight Integrated calculations discussed earlier along with a 10% minimum reduction in the FAA Crew Scheduling costs for the Supplemental, Freight Narrow-body, and Freight Wide-body carriers indicates the annual Cargo-Only Annual Crew Scheduling costs should be lowered by the FAA from $52 million to no more than $34.6

[152] Initial Supplemental RIA at 68, Table 21: Annual Crew Scheduling Costs.

million,[153] and even this figure may be too high. The fact that the FAA acknowledges that it did not receive any crew schedule data from supplemental carriers[154] calls into question FAA's calculation of crew scheduling costs of complying with the Final Rule for the supplemental carriers. The very nature of supplemental operations is that they are not scheduled. Thus, creating a "synthetic supplemental carrier . . . [based on] modification of the freight wide-body case"[155] may or may not have any relationship to reality. Quite simply, no one knows. IPA does not purport to know what the crew scheduling impacts for supplemental carriers would be, and, in all honesty, FAA does not know. Notwithstanding this lack of knowledge, FAA calculates that the crew scheduling impacts will amount to $15 million per year for supplemental carriers.[156] This is roughly 72% of the true crew scheduling costs for freight integrated carriers.[157] FAA's estimate of crew scheduling costs thus has a very large impact on the overall estimate of costs of complying with the Final Rule for the all-cargo industry.

It is inappropriate for a decision on including or excluding the freight integrated carriers within the scope of the Final Rule to be based, to a significant extent, on costs for supplemental carriers that essentially amount to sheer speculation. If, despite IPA's argument that FAA is not entitled to consider costs in this rulemaking, FAA insists on proceeding with a BCA, it should analyze the costs and benefits of compliance with the Final Rule separately for freight integrated carriers, for which actual data for estimating

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[153] The numbers used to calculate this value are shown in the Table entitled "Scheduling Cost Computations" in Documentation for IPA Cost Calculations, attached at Exhibit 24.

[154] Initial Supplemental RIA at 49.

[155] *Id.*

[156] Initial Supplemental RIA at 68, Tale 21: Annual Crew Scheduling Costs.

[157] 15 ÷ 20.7 = .724

costs may be obtained, and not taint it with the speculative costs and benefits FAA ascribes to the supplemental carriers.

FAA Overstates the Costs of Retrofitting Aircraft with Compliant Rest Facilities

The Final Rule requires onboard rest facilities for augmented crew operations, i.e., when 3 or more pilots are required for the scheduled duty period. FAA asserts that if rule applied to cargo airlines, rest facilities would have to added to 107 aircraft,[158] although FAA did not provide specific detail regarding type or types of aircraft that would require such facilities. However, long range aircraft such as the B-747 and MD-11 already have integrated Class 1 rest facilities. Thus, it appears from IPA's analysis that the only aircraft that would require rest facilities would be the B-767.

Moreover, only extended range B-767s have a requirement for rest facilities.[159] A non-extended-range B-767 has an operational range of only 3,200 nautical miles (approximately 6.5 flight hours), while the extended range version has an operational range of 5,500 nautical miles (11 hours). The longer range and block times dictate that a rest facility be included only on the extended range versions. There are only 75 extended range

[158] Initial Supplemental RIA at 79.

[159] The following all-cargo operators currently have B-767s in their fleets:

- UPS (56 extended range versions)
- ABX Air (35, of which 5 are extended range)
- Atlas (9, of which 5 are extended range);
- ATI (6, of which 2 are extended range);
- North American (5 extended range)
- Amerijet (2, none of which are extended range)
- Florida West International (2 extended range)
- **Total: 113, of which 75 (66%) are extended range.**

Note: the difference between FAA's estimate of 107 aircraft and IPA's calculation of 113 aircraft may be due to the fact that FAA mischaracterized Atlas and ATI as all-cargo carriers, not supplemental carriers, and FAA apparently used 2010 data, whereas IPA reviewed 2012 data.

versions of the B-767 aircraft in the air cargo fleet. Thus, calculation of retrofitting should be limited to these 75 aircraft, not the 107 aircraft that FAA posits.

FAA asserts that installing compliant rest facilities in cargo aircraft will cost cargo operators $66 million over ten years.[160] In doing so, FAA totally disregards consideration of any other type of rest facility other than a Class 1 rest facility, the "Cadillac" of rest facilities, costing $445,000 each.[161] FAA provides no explanation as to why only the Class 1 rest facility was priced out and the other, less expensive Class 2 or Class 3 options[162] were not. Presumably, the purpose of including the other two options for rest facilities in the Final Rule was to reduce implementation costs for carriers, so it is curious that FAA does not recognize these less costly and more realistic options in its cost analysis.[163]

Due to shorter range of a B-767 compared to the MD-11, B-777, and B-747, a Class 3 rest facility is a very cost effective fit for the B-767, providing a viable low-cost option

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[160] Initial Supplemental RIA at 83; see also *Id*. at 75-81. FAA's calculation is as follows:

- 107 total cargo aircraft requiring modification (to include short range B-767-200 aircraft)
- Only Class 1 considered in spite of other Final Rule options
- Installation cost: $445,000 per unit.
- Aircraft downtime: 4 days, $13,233 per day
- 300 pounds per unit, resulting in recurring annual fuel cost of $8,746 per aircraft
- Engineering cost: $3M (one-time)
- Total cargo cost: **$66M** (2012 to 2023)

[161] *Id*. at 79.

[162] *Id.* at 76.

[163] It is unclear whether FAA's statements that its assumptions represent "the worst case scenario because aircraft will be re-optimized based upon current configurations" and that it "conservatively" assumes that all aircraft "will have a Class 1 facility installed for an upper-bound estimation," Initial Supplemental RIA at 79, relate to the number of aircraft or the type of facility FAA assumes will be installed. Note that FAA made these statements with respect to passenger aircraft, but then simply stated that if the Final Rule were extended to cover cargo-only operations, 107 additional aircraft would require facilities to be installed. *Id*. Presumably FAA made the same assumptions with respect to cargo operations. In any event, FAA did not include a range of costs, with an upper bound and a lower bound. Rather, it flatly presented the costs as definitive in the analysis of costs and benefits at the end of the RIA.

that would permit crew augmentation of the B-767 and allow carriers to conduct extended duty time operations. A Class 3 rest facility is simply a chair that reclines 40 degrees and provides foot and leg support.[164] Such a chair could be installed in place of the center observer seat in the cockpit of all B-767's, where the current observer seat reclines 26 degrees and has no foot or leg support. The cockpit configuration provides room for a replacement observer seat to recline up to 50 degrees and to include horizontal foot and leg support. Another option is to replace one of the three bulkhead seats with a seat similar to this already flight-certified crew member seat. This seat model reclines 34 degrees; of course, an actual replacement seat would have to recline 6 more degrees to achieve the necessary 40 degrees of reclining.

[164] *Id*. at 76.

Based on information from a major U.S. supplier of aerospace and military products, the purchase price of the Class 3 compliant seat would be approximately $59,000. The Class 3 compliant seat would fit in the existing seat track system, and could easily be installed by simply switching out the current seat for a seat that reclines 40 degrees, with a footrest. This is not a complicated or time-consuming process. According to job guide, full replacement of the observer seat in a B-767 is a 4-hour task, and no specialized aircraft mechanic skills are required to perform it. Installation of a new seat could be accomplished during normal cargo aircraft down time, such as 0900 to 1400 local time, or on Sundays, or, if necessary, during routine maintenance on the aircraft. Thus, there are no downtime costs associated with this installation, since aircraft do not have to be pulled out of service. IPA estimates that the installation costs would be no more than $1000 per unit, and would most likely be less. Thus, the installed price of the seat would be not exceed $60,000.[165]

Because the replacement seat uses the existing aircraft seat track system, and no life support modifications (additional restraints, oxygen provisions, etc.) are necessary, the engineering costs would be much less than FAA estimates for a Class 1 rest facility. Basically, the engineering issues are limited to ensuring that the seat can recline safely and is sufficiently reinforced to meet the relevant G force standards. IPA estimates that the engineering costs associated with this modification would amount to $1 million.

The compliant seat weighs could weigh up to 10 lbs. more than the non-compliant seat it would replace, depending on the level of lightweight composite materials utilized in the engineering design. Therefore, using FAA's methodology, fuel costs for a 10 lb. aircraft

[165] $59,000 + $1000 = $60,000.

weight increase would be increase by $291 per aircraft per year, for a total of approximately $200,000 over the same period for which FAA has calculated increased fuel burn.

In summary, the Total Class 3 Option Cost for installing compliant rest facilities onboard cargo 767 aircraft is approximately $5.7 million, broken down as follows:

- Engineering: $1M
- Installed Cost of Seat: $4.5 M[166]
- Aircraft Downtime: $0M
- Fuel: $0.2M

Therefore, FAA's elaborate identification of secondary and tertiary costs, while seemingly very thorough, is ill-founded, because it rests on a fundamentally unsound premise – that cargo carriers would opt for the most expensive solution. If carriers could comply with the rest facility requirement for augmented operations at a total cost of $5.7 million, but opt instead for a more costly rest facility, the incremental costs of installing the more expensive rest facilities cannot legitimately be considered a cost of compliance with the Final Rule. Because carriers could install the new seats as a result of being made subject to the Final Rule in order to maintain their operations,[167] it appears that FAA has overestimated the costs of installing rest facilities on cargo aircraft as a result of the Final Rule by $60.3 million.

Some Non-Compliant Operations Can be Modified Slightly to Become Compliant, Without Significant Disruption of Operations.

[166] $60,000 X 75 = $4,500,000.

[167] IPA's analysis of current UPS B-767 pilot duty schedules indicates that only 6.7% of all UPS pilot flight duty periods are flown with augmented 3-pilot crews (and would consequently require a rest facility under the Final Rule). *If a Class 3 rest facility/seat is installed, 95% of the augmented UPS duty schedules could be flown as currently scheduled, with no operational interruption.* 5% of the duty periods, or just 0.4% of the total UPS pilot B-767 flight duty periods, would not be compliant. However, the highest duty periods exceed base Final Rule by only 28 minutes, which is within the 30 minute duty extension window granted by the Final Rule. Compliance can be managed by the carrier in many ways, such as hiring additional loaders to reduce ground stop times, slightly increasing aircraft cruise speed, etc.

The GRA Summary points out that, for certain split duty shifts, some crews barely miss the 3 hrs. 15 min. threshold that FAA determined is necessary for the crews to complete their paperwork and debriefing, and be shuttled to and from the rest facilities so as to obtain 2 hours of rest.[168] Without incurring much expense, the cargo carrier in this circumstance should be able to green light such crews for priority in completing the debriefing process and obtaining transportation to and from their rest facilities to ensure that they obtain the necessary 2 hours of rest. FAA should take into account such opportunities for low cost operational modifications, in order to establish realistic cost estimates.

FAA Overstated Costs By Failing to Incorporate Data from Studies FAA Cited in its Estimate of Cost Reductions for Air Carriers

FAA Underestimated Cost Reductions Due to Reduced Sick Leave for Pilots

FAA cites studies showing up to 40-60% reductions in sick time after fatigue-countering measures were implemented by companies.[169] However, FAA assumes that pilot sick time will be reduced by only 5% as a result of the Final Rule,[170] and FAA's sensitivity analyses use only a range of 3-7% reduction in sick time.[171] FAA does not discuss why its assumed reductions in sick time are an order of magnitude less than the reductions found in the studies FAA cites to justify inclusion of reduced sick time in the RIA. FAA should revise its assumptions to be consistent with the studies it cites or at least perform a sensitivity analysis that includes the full range of potential benefits suggested by the studies it cites.

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[168] GRA Report at 43-44.

[169] Initial Supplemental RIA at 22-24.

[170] *Id.* at 72.

[171] *Id.* at 135-137.

A Properly Prepared Benefit Cost Analysis Provides Support for Including Cargo Operations Within the Scope of the Final Rule

In reviewing the Interim Supplemental RIA, IPA hired a leading BCA expert, David Berkey, who has performed other BCAs as a subcontractor for the FAA, DOT, TSA, EPA, DOE and private industry, to determine what standards apply to conducting a BCA, what a reasonable, professional BCA on this issue would be, and what FAA overlooked or did incorrectly.[172]

With his help, IPA has identified the deficiencies, set forth above, where FAA grossly underestimated benefits or should have considered alternative scenarios. He also helped us identify the key areas where the Initial Supplemental RIA deviated significantly from customary and usual practices associated with conducting Benefit/Cost studies in the aviation industry.

Following the applicable guidance and using more realistic assumptions and estimates, including a very limited sensitivity analyses and a rough, but still conservative figure for difficult to quantify benefits, Mr. Berkey estimates that:

The nominal benefits in the base case lower bound amount to $19.6 million, and the upper bound would be $476.8 million, with a midpoint of $253.2 million. Applying sensitivity to consider a higher fatality scenario for the upper bounding condition, yields the same lower bound, but an upper bound of $609.8 million, with a midpoint of $314.7 million.

If a rough-order of magnitude estimate is made to account for qualitative and tangible benefits[173] not directly captured in the analysis, the lower bound of benefits in the

[172] Mr. Berkey's analysis and methodology are attached at Exhibit 26.

[173] Qualitative and tangible impacts captured using this approach include, but are not limited to, avoidance of pilot fatigue-related accidents on the tarmac during taxiing, the presence of more alert pilots in the cockpit who are better able to deal with (1) in-flight anomalies before they become

base case increases to $81.6 million, and the upper bound becomes $610.8 million. Applying sensitivity to consider number of fatalities avoided, the lower bound remains at $81.6 million, but the upper bound increases to $733.8 million.

Comparing these benefits to the IPA-corrected estimate of costs $320 million for applying the final rule to cargo operations, leads to the following results:

- In the high case, when applying sensitivity to accident consequences, benefits exceed costs by more than $400 million, and, when using the less severe upper bound for accident consequences, benefits exceed costs by more than $ 290 million.

- The mid-point between the low and high case benefit scenarios would exceed costs by approximately $87 million in the sensitivity case and $26 million in the base case. Without the rough order of magnitude estimate for tangible and qualitative benefits, the mid-point for estimate with sensitivity analysis would result in a slightly negative net benefit.

- When considering the base case with no sensitivity and no rough order of magnitude estimate for tangible and qualitative benefits the mid-point be negative, but by less than $70 million in the worst case scenario. And it must be noted that this did not include any attempt to monetize benefits that FAA itself has recognized, such as avoiding fatigue-based taxiway/ramp accidents.

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serious and (2) in flight emergencies; the premium value attributed to expedited and perishable cargo, such as pharmaceutical supplies, medical equipment, donor transplant organs and time-sensitive legal and governmental documents; general health improvements of pilots who do not suffer from chronic fatigue, and post-accident delayed health costs from toxic and other chemical substances released as a result of the accident.

BASE CASE[174]

Benefits Summary—Base Case (Dollars In Millions)			
Range	**Nominal**	**7%**	**3%**
Lower Bound	**$19.6**	**$12.9**	**$16.3**
Mid-point	$253.2	$166.2	$209.7
Upper Bound	**$486.8**	**$319.5**	**$403.1**
IPA Cost	$320.0	$212.2	$266.2
Net Benefit			
Lower Bound	**-$300.4**	**-$199.4**	**-$249.9**
Mid-point	**-$66.8**	**-$46.**	**-$56.5**
Upper Bound	**$166.7**	**$107.3**	**$137.0**

Benefits Summary—Base Case with Rough Order-of-Magnitude Estimate for Qualitative and Tangible Benefits (Dollars In Millions)			
Range	**Nominal**	**7%**	**3%**
Lower Bound	**$81.6**	**$53.6**	**$67.6**
Mid-point	$346.2	$227.2	$286.7
Upper Bound	**$610.8**	**$400.9**	**$505.8**
IPA Cost	$320.0	$212.2	$266.2
Net Benefit			
Lower Bound	**-$238.4**	**-$158.7**	**-$198.6**
Mid-point	**$26.2**	**$15.0**	**$20.6**
Upper Bound	**$290.7**	**$188.7**	**$239.7**

[174] Lack of sufficient information precluded developing discrete estimates for certain qualitative and tangible benefits. Using best judgment, these have been conservatively monetized to the extent practicable by applying per annum during the 10-year benefit period, a rough-order-of-magnitude estimate equal to the value of a statistical life ($6.2 million) for the lower bound, and twice this value ($12.4 million) per annum for the upper bound. Qualitative and tangible impacts captured using this approach include, but are not limited to, avoidance of pilot fatigue-related accidents on the tarmac during taxiing, the presence of more alert pilots in the cockpit who are better able to deal with (1) in-flight anomalies before they become serious and (2) in flight emergencies; the premium value attributed to expedited and perishable cargo, such as pharmaceutical supplies, medical equipment, donor transplant organs and time-sensitive legal and governmental documents; general health improvements of pilots who do not suffer from chronic fatigue, and post-accident delayed health costs from toxic and other chemical substances released as a result of the accident.

SENSITIVITY CASE—EL AL CRASH CONSEQUENCES FOR UPPER BOUND

Benefits Summary—Sensitivity Case* (Dollars In Millions)			
Range	**Nominal**	**7%**	**3%**
Lower Bound	**$19.6**	**$12.9**	**$16.3**
Mid-point	$314.7	$206.6	$260.6
Upper Bound	**$609.8**	**$400.3**	**$505.0**
IPA Cost	$320.0	$212.2	$266.2
Net Benefit			
Lower Bound	**-$300.4**	**-$199.4**	**-$249.9**
Mid-point	**-$5.3**	**-$5.7**	**-$5.5**
Upper Bound	**$289.7**	**$188.0**	**$238.8**

* **Uses El Al accident scenario for upper bound.**

Benefits Summary—Sensitivity Case with Rough Order-of-Magnitude Estimate for Qualitative and Tangible Benefits* (Dollars In Millions)			
Range	**Nominal**	**7%**	**3%**
Lower Bound	**$81.6**	**$53.6**	**$67.6**
Mid-point	$407.7	$267.6	$337.6
Upper Bound	**$733.8**	**$481.7**	**$607.7**
IPA Cost	$320.0	$223.4	$280.3
Net Benefit			
Lower Bound	**-$238.4**	**-$169.8**	**-$212.6**
Mid-point	**$87.7**	**$44.2**	**$57.4**
Upper Bound	**$413.7**	**$258.2**	**$327.4**

* **Uses El Al accident scenario for upper bound.**

Thus, when FAA's errors in estimating cargo carriers' costs of compliance are corrected and consideration is given to the full range of realistic benefits from applying the Final Rule to cargo operations, the benefit cost ratio is positive. Only by denying any monetization of benefits that FAA itself has acknowledged are real and potentially substantial, would the mid-point of any net benefit cost comparison be negative.

In light of these considerations, FAA should amend the Final Rule to cover cargo operations.

III. FAA is not entitled to consider costs under its statutory mandate

A. FAA Impermissibly Relied on a Benefit-Cost Analysis to Ignore Congress' Directive to Utilize Scientific Information on Pilot Fatigue

FAA's only stated reason for ignoring Congress' clear command to issue science-based regulations to address the problem of pilot fatigue is that the costs of compliance for all-cargo operations far exceed the societal benefits[175]. FAA's reliance on its BCA is impermissible because

[175] Final Rule at 336.

the Safety Act[176] does not authorize FAA to ignore the best scientific information and decline to address acknowledged problems of pilot fatigue based on a BCA.

The Supreme Court has made clear that the factors an agency may consider in issuing regulations depend "on what authority the statute confers." *Whitman v. Am. Trucking Ass'n*, 531 U.S. 457, 465 (2001). Where Congress has specified the factors to be used, an agency may consider costs only if Congress made a "textual commitment of authority to the agency to consider costs . . . ." *Whitman*, 531 U.S. at 468. Absent such a commitment of authority, "'economic considerations play no part in the promulgation of [regulations].'" *Id.* at 464 (quoting *Lead Indus. Ass'n v. EPA*, 647 F.2d 1130, 1148 (D.C. Cir. 1980) (finding that Congress did not authorize EPA to consider costs in promulgating ambient air quality standards under the Clean Air Act)).

Moreover, Congress' commitment of authority to consider costs must be express; Congress "does not alter the fundamental details of a regulatory scheme in vague terms or ancillary provisions—it does not, one might say, hide elephants in mouseholes." *Id.* In *Whitman*, the Court concluded that the cost "factor is *both* so indirectly related to public health *and* so full of potential for canceling the conclusions drawn from direct health effects that it would surely have been expressly mentioned in §§ 108 and 109 [of the Clean Air Act] had Congress meant it to be considered." *Id.* at 469 (emphasis in original).

The rationale of *Whitman*, *Lead Industries*, and similar cases applies here to preclude FAA from using cost considerations to exclude all-cargo operations from the Final Rule. Congress directed FAA to "issue regulations, based on the best available scientific information, to specify limitations on the hours of flight and duty time allowed for pilots to address problems relating to pilot fatigue." Safety Act at § 212(a)(1). Congress further directed that, in developing the new

[176] Airline Safety and Federal Aviation Administration Extension Act of 2010, Public Law 11-216, 124 Stat. 2348 (2010).

regulations, FAA "consider and review" twelve specific subjects,[177] all of which relate to the causes of fatigue and ways to address fatigue:

> (a) FLIGHT AND DUTY TIME REGULATIONS.—
> . . .
> (2) MATTERS TO BE ADDRESSED.—In conducting the rulemaking proceeding under this subsection, the Administrator shall consider and review the following:
> (A) *Time of day of flights in a duty period.*
> (B) Number of takeoff and landings in a duty period.
> (C) *Number of time zones crossed in a duty period.*
> (D) *The impact of functioning in multiple time zones on different daily schedules.*
> (E) *Research conducted on fatigue, sleep, and circadian rhythms.*
> (F) *Sleep and rest requirements recommended by the National Transportation Safety Board and the National Aeronautics and Space Administration.*
> (G) International standards regarding flight schedules and duty periods.
> (H) Alternative procedures to facilitate alertness in the cockpit.
> (I) Scheduling and attendance policies and practices, including sick leave.
> (J) The effects of commuting, the means of commuting, and the length of the commute.
> (K) Medical screening and treatment.
> (L) Rest environments.
> (M) Any other matters the Administrator considers appropriate.
>
> *Id.* at § 212(a)(2) (Emphasis added).

Nowhere does Congress state or imply that FAA should or could consider the costs and benefits of compliance as a factor in developing new flight duty and rest rules.

As with the provision of the Clean Air Act at issue in *Whitman*, FAA cannot consider cost issues under the Safety Act because cost issues are both "far removed" from addressing the problems of pilot fatigue based on science, and, as FAA's decision demonstrates, cost considerations can "cancel" the science-based conclusions Congress sought. *See Whitman*, 531 U.S. at 469. Simply stated, FAA cannot establish the science-based safety standards Congress

[177] Congress also directed FAA to consider "any other matters the Administrator considers appropriate," Safety Act at § 212(a)(2)(M) as discussed below.

demanded if the terms of the Final Rule are determined by cost considerations.[178]

Congress' intent to focus on addressing the problem of fatigue via a science-based approach is made clear in the legislative history as well. An "updated rule will more adequately reflect the operating environment of today's pilots and will reflect scientific research on fatigue." H.R. REP. NO. 11-284, at 7. Consideration of operating costs to the carriers does not reflect the pilot's operating environment or scientific research on fatigue. Moreover, Congress enacted the fatigue provisions of the Safety Act, in part, to force FAA to act despite FAA's inability to find a consensus solution. *Id.* As FAA itself has made clear, one of the major stumbling blocks to reaching consensus was the insistence by the cargo carriers that they be subject to separate rules.[179] Congress intended to direct FAA to adopt new rules based on modern fatigue science rather than the cost impacts to any sector of the industry.

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[178] While the Supreme Court in *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208 (2009), held that a provision in the Clean Water Act (CWA) mandating that EPA require the "best technology available for minimizing adverse environmental impact," permitted EPA to use a cost-benefit analysis in formulating health-related standards, the statute in that case is quite different from the Safety Act. The Court reasoned that the phrase "best technology" could be understood as meaning "the technology that *most efficiently* produces some good," and not necessarily technology that best reduces adverse environmental impacts. *Id.* at 218 (emphasis in original). But there is no modifier similar to "best" or even "technology" in Section 212 of the Safety Act.

More importantly, in *Riverkeeper*, the CWA provision at issue was *completely silent* as to what factors the EPA could consider. The Court held that the EPA could reasonably conclude that this complete silence "was meant to convey nothing more than a refusal to tie the agency's hands as to whether cost-benefit analysis should be used." *Id*. at 222. Unlike the provision at issue in *Riverkeeper*, the Safety Act is not "silent . . . with respect to all potentially relevant factors." *Id.* Instead, the Safety Act contains a list of 12 factors the FAA was to "consider and review" in developing the mandated duty and rest regulations. *See* Safety Act at §212.

In *Riverkeeper*, the Court distinguished *Whitman v. American Trucking*, stating that the statute in *Whitman* foreclosed any such interpretation, because it was not completely silent on the factors to be considered by the agency. *Id*. at 223. Like the Safety Act, the statute in *Whitman* prescribed factors the agency was to consider in defining criteria air pollutants and setting air quality standards for those pollutants. 531 U.S. 457, 465 (2001). Thus, even under the reasoning of *Riverkeeper*, Congress's silence on the consideration of costs in the context of a *Whitman*-like statute would be interpreted as prohibiting the consideration of a coat-benefit analysis.

[179] Proposed Rule at 55853.

This focus on safety and science is consistent with Congress' general charge that FAA "assign[], maintain[], and enhanc[e] safety and security as the highest priorities in air commerce." 49 U.S.C. § 40101(d). There is simply no express authorization by Congress that FAA should or could dilute its safety responsibilities with cost considerations.

Not surprisingly, given Congress' overriding safety priority, there are relatively few instances where Congress has directed FAA to consider costs as part of its rulemaking. Nonetheless, it is clear that Congress has selectively chosen when to allow FAA to consider costs, underscoring that, in the Safety Act, Congress deliberately withheld such authorization. For example, in developing the terms of airport operating certificates for commuter airports, Congress directed FAA to "identify and consider a reasonable number of regulatory alternatives and select from such alternatives the least costly, most cost-effective or least burdensome alternative that will provide comparable safety at [other kinds of airports]." *Id.* at § 44706(d). Similarly, FAA may exempt certain airports from certification requirements regarding firefighting and rescue equipment "when the Administrator decides that the requirements are or would be unreasonably costly, burdensome, or impractical." *Id.* at § 44706(c) (Addendum 44). *See also id.* at § 44901(d)(2)(B)(iii) (in considering waivers to placing explosive detection systems in airports for security screening, TSA may consider "the feasibility and cost-effectiveness of deploying explosive detection systems" in other parts of the airport) (Addendum 47).

Moreover, when regulating safety in general, and duty hours in particular, in other segments of the transportation industry, Congress knows how to require that costs and benefits be considered. For example, in 49 U.S.C. § 31136(c)(2) Congress directed the Federal Motor Carrier Safety Administration "to consider, to the extent practicable and consistent with the purposes of this chapter (A) costs and benefits" before prescribing new hours of service rules. (Addendum 48). *See*

Public Citizen v. FMCSA, 374 F.3d 1209, 1212 (D.C. Cir. 2004) (summarizing statutory framework for FMCSA's hours of service regulations). No similar provision applies to FAA authority to issue flightcrew member duty and rest rules, and it may not be read into FAA's statutory mandate.

In other statutes, Congress has indicated in the legislative history that it expected the agency to consider costs, even when safety was the "overriding consideration." *See Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 55 (discussing agency consideration of costs in challenge to crash protection rulemaking) (citing S. Rep. No. 1301, at 6, U.S. CODE CONG. & ADMIN. NEWS 1966, p. 2714). Congress made no such indication in the Safety Act or its legislative history.

To the extent FAA relies on EO 12866 for authority to consider costs in conducting this rulemaking, such reliance is misplaced. Fundamentally, "the President is without authority to set aside congressional legislation by executive order, and the 1993 executive order [12866] does not purport to do so." *In re United Mine Workers of Am. Int'l Union*, 190 F.3d 545, 551 (D.C. Cir. 1999). In fact, the Executive Order explicitly provides that "Nothing in this order shall be construed as displacing the agencies' authority or responsibilities as authorized by law." EO 12866 at § 9. Moreover, the provisions of the Executive Order relating to analysis of costs and benefits specifically state that they apply (a) "unless a statute requires another regulatory approach," *id.* at § 1(a); (b) "to the extent permitted by law," *id.* at § 1(b) and § 6(b); and (c) "unless prohibited by law," *id.* at § 6(a)(3)(C). Thus, there is no conflict between the mandates imposed on FAA by the Executive Order and the Safety Act, because the Executive Order explicitly gives way to laws that preclude consideration of costs.

Similarly, E.O. 13563, which "is supplemental to and reaffirms the principles, structures, and definitions governing contemporary regulatory review that were established

in Executive Order 12866," states that "nothing in this order shall be construed to impair or otherwise affect . . . the authority granted by law to a department or agency, or the head thereof," and that "This order shall be implemented consistent with applicable law." E.O. 13563 §§ 1, 7(b), and 7(c).

The fact that Congress allowed FAA to consider "[a]ny other matters the Administrator considers appropriate," Safety Act at § 212(a)(2)(M) (Addendum 7), does not allow FAA to use cost considerations to ignore all of the fatigue science, and the prior findings of the NTSB and FAA itself. Congress does not "hide elephants in mouseholes" and allow vaguely stated ancillary provisions to create a loophole big enough to allow FAA to ignore the factors Congress *expressly* required FAA to consider. *Whitman*, 531 U.S. at 468. Congress would not have relied on such a "modest" phrase as "other matters [FAA] considers appropriate" to allow cost considerations to cancel out the scientific information and safety issues it specified. *See id.*

Because FAA impermissibly relied on its BCA to override its own scientific findings regarding pilot fatigue and left in place flightcrew member duty and rest rules for all-cargo operations that, by FAA's own admission, fail to address the problem of pilot fatigue, FAA's decision to exclude all-cargo operations from the Final Rule violates Congress's mandate to the agency. FAA should therefore issue a regulatory amendment that extends the scope of the Final Rule to cover all-cargo operations consistent with its scientific findings, the congressional mandate to address pilot fatigue, and FAA's past practice of applying regulations to ensure the health, and prevent the similar impairment of, pilots equally to those who fly in cargo and passenger operations.

By Excluding Cargo Operations from the Final Rule, FAA Has Deviated From Its Previously Consistent Practice of Regulating Pilot Fitness to Fly Exactly the Same for Cargo and Passenger Operations

In protecting against the potential impairment of commercial service pilots, *FAA has always consistently applied the same standards to pilots in cargo and passenger operations-- until it issued the Final Rule*. For example, there is no difference in the way FAA regulates pilots' use of alcohol and/or drugs. Thus, it is highly relevant that numerous scientific studies have concluded that the cognitive and motor performance of a person experiencing moderate levels of fatigue, i.e. those associated with 17 hours or more of wakefulness, is impaired *as much as or more than* the cognitive and motor performance of a person registering a blood alcohol concentration of .05.[180] Simply put, *a pilot suffering from such fatigue poses – at the very least – a risk equal to that of a pilot with a blood alcohol concentration of .05 or greater*.

Significantly, the *FAA prohibits anyone from acting as a crewmember on a civil aircraft who has a blood alcohol concentration of .04 or greater in all-cargo operations,* as well as passenger operations.[181] The dangers associated with alcohol impairment are undeniable; the FAA has regulated crewmember use of "liquor and drugs" for nearly 60

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[180] *See* Nicole Lamond and Drew Dawson, *Quantifying the Performance Impairment Associated with Fatigue*, 8 J. Sleep Research 255 (1999) (attached as Exhibit 27). *See also* Adam Fletcher, Nicole Lamond, Cameron J. van den Heuvel, and Drew Dawson, *Prediction of Performance During Sleep Deprivation and Alcohol Intoxication Using a Quantitative Model of Work-Related Fatigue*, 5(2) Sleep Research Online 67 (2003) (attached as Exhibit 28); A M Williamson and Anne-Marie Feyer, *Moderate Sleep Deprivation Produces Impairments in Cognitive and Motor Performance Equivalent to Legally Prescribed Levels of Alcohol Intoxication*, 57 Occupational Envtl. Med. 649 (2000) (attached as Exhibit 29); Drew Dawson, Nicole Lamond, Katharine Donkin, and Kathryn Reid, *Quantitative Similarity Between the Cognitive Psychomotor Performance Decrement Associated with Sustained Wakefulness and Alcohol Intoxication*, Queensland Mining Industry Health and Safety Conference Proceedings (1998), *available at* http://www.qrc.org.au/conference/_dbase_upl/1998_spk005_Dawson.pdf (attached as Exhibit 30); Drew Dawson and Kathryn Reid, *Fatigue, Alcohol, and Performance Impairment*, 388 Nature 235 (1997) (attached as Exhibit 31).

[181] 14 C.F.R. § 91.17(a)(4).

years.[182] In light of these accepted dangers, it is no surprise that, since its inception, the FAA's regulation of alcohol and/or drugs has applied to crewmembers of *all* civil aircraft.[183] Thus, it is incomprehensible that FAA would exempt air cargo operations from the Final Rule, despite the fact that a fatigued air cargo pilot poses a safety risk equal to -- if not greater than -- that posed by an air cargo pilot registering a blood alcohol concentration FAA has deemed unacceptable.[184] The inconsistent treatment of alcohol-related impairment and fatigue-related impairment also defies the statutory requirement that the agency "consider the duty of an air carrier to provide service with the highest possible degree of safety in the public interest." [185]

Until the current rulemaking, FAA has scrupulously regulated activities that could lead to impairment of cargo pilots exactly as it has done for potential impairment of passenger pilots. If FAA were consistent in regulating the safety of cargo operations, it would either say that drug and alcohol ingestion by cargo pilots need not be regulated as strictly as for passenger pilots, because of the more serious impacts from passenger aircraft accidents it cites in the current rulemaking proceeding[186] or FAA would include cargo operations within the scope of regulations guarding against impairment of pilots due to fatigue, just as it guards against impairment of pilots in cargo and passenger operations due

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[182] Air Traffic and General Operating Rules, 28 Fed. Reg. 6702, 6704-05 (June 29, 1963).

[183] 14 C.F.R. § 91.17(a).

[184] 77 Fed. Reg. 336.

[185] 49 U.S.C. § 44701(d)(1)(A).

[186] FAA could say, as it does in this rulemaking with respect to fatigue, that drug and alcohol consumption is a serious problem and as long as it does not cost carriers significant money to implement the restrictions, it will regulate pilots' ingestion of drugs and alcohol. This begs the question, if it *did* cost cargo carriers money to restrict pilots' drug and alcohol intake, would FAA seriously say, "Well, in that case, we will let the pilots fly drunk, because the worst that could happen is that they will just crash one plane and kill only themselves"?

to ingestion of drugs and alcohol. Scientific studies demonstrating that the impacts of fatigue are roughly equivalent to the alcohol levels that FAA prohibits are certainly relevant to this rulemaking, but it appears that FAA did not consider them.

Consumption of drugs and alcohol are not the only areas where FAA regulates to ensure that pilots in cargo operations as well as passenger operations are fit to perform their duties. For instance, FAA also requires pilots in passenger and cargo operations alike to pass the same health examination[187] and hold an appropriate medical certificate.[188] Furthermore, pilots suffering from known or suspected medical deficiencies that would make them unable to meet the requirements for a medical certificate or who are taking medication or receiving other treatment for a medical condition that would make them unable to meet the requirements for a necessary medical certificate may not act as a pilot in command or other required flight crewmember in passenger or cargo operations.[189]

Finally, the mandatory retirement age for pilots (based on health and safety concerns) has been the same for cargo and passenger pilots, both before and after FAA raised the retirement age from 60 to 65 in 2007 at the direction of Congress.[190]

Thus, FAA's decision to exclude cargo operations from new regulations designed to prevent pilot fatigue is a sharp deviation from FAA's previous, consistent regulatory efforts to ensure that cargo and passenger pilots are equally fit to fly.[191]

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[187] 14 CFR § 61.23.

[188] *See, e.g., id.* at §§ 61.3 and 61.23.

[189] *See id.* at § 61.53.

[190] *See id.* at Part 121. *Id.* at § 121.383(c) (2007) (Part 121 provision regarding age restriction prior to passage of 49 U.S.C. § 44729); *id.* at § 121.383(d) (Part 121 provision regarding age restriction subsequent to passage of 49 U.S.C. § 44729); Part 121 Pilot Age Limit, 74 Fed. Reg. 34229 (July 15, 2009).

[191] FAA attempts to justify the cargo carve-out by stating that it has excluded cargo operations from

Conclusion

Excluding Cargo Operations from the Final Rule is Illogical

The approach taken by FAA to exclude cargo operations but include passenger operations within the scope of the Final Rule is particularly perplexing in the context of an agency following a congressional mandate to enhance safety, as the following hypothetical example illustrates: Suppose that FAA determined, after a passenger aircraft accident due to engine failure, that a particular type of aircraft engine is defective. The agency gathers information and finds that this particular engine has been installed on both passenger planes and cargo planes, although in proportionately greater numbers on cargo planes. Under these circumstances, it is inconceivable that FAA would merely order that the passenger airplane

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other safety rules. Final Rule at 336. But, the only example FAA cites, Expanded Operations (ETOPS) of Multi-Engine Airplanes, 72 Fed. Reg. 1808, 1808 (Jan. 16, 2007), is simply not comparable to the problem of pilot fatigue in cargo operations. If anything, the reasons FAA decided to exclude some cargo operations from the ETOPS rule should move FAA to *include* cargo operations in the Final Rule.

Fundamentally, FAA excluded cargo operations from most aspects of the multi-engine ETOPS rule because the rule was intended to address problems particular to passenger operations, a point several cargo-industry comments noted in response to the Proposed Rule. *See* Comments of FedEx Express, Docket No. FAA-1999-6717-0104, Mar. 12, 2004, at 10; Comments of Cargo Airline Association, Docket No. FAA-1999-6717-0113, Mar. 15, 2004, at 1-2. For example, cargo operations were excluded from regulations addressing passenger-specific issues such as a passenger recovery plan and the use of airports with "facilities . . . sufficient to protect the passengers from the elements and to see to their welfare." 14 C.F.R. § 121.97(b)(1)(ii). FAA emphasized that a primary reason for applying the ETOPS regulations to passenger aircraft was that diversions for non-mechanical purposes, such as passenger illness, applied to all flights regardless of the number of engines in the aircraft. *See* 68 Fed. Reg. at 64732; 72 Fed. Reg. at 1812-14. Moreover, where the safety of cargo operations was at issue, FAA declined to exclude all-cargo operations from the ETOPS rule. *E.g.*, 14 C.F.R. Part 121, Appendix P, Section III (safety of crewmembers flying on extended routes within the North and South Polar regions). As a result of using actual safety risks to tailor the scope of the final ETOPS rule, FAA could state that it had "determined that no reduction in safety would occur" as a result of the changes. 72 Fed. Reg. at 1816.

FAA does not, and cannot, make a similar statement here. As FAA concedes, the problem of pilot fatigue is universal. Indeed, many aspects of the Final Rule from which cargo is excluded are, in fact, intended to address fatigue issues particular to all-cargo operations, such as split duty rest and consecutive nights of flying with split duty rest. Rather than exclude all-cargo operations from the Final Rule, FAA should follow the approach it actually followed in the ETOPS rule and apply the Final Rule to all operations – cargo and passenger – where fatigue presents a genuine safety risk.

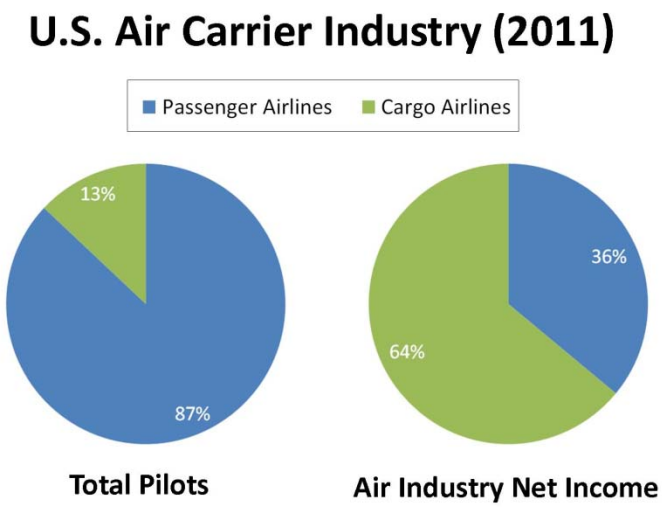
engines be examined and replaced or repaired, but not the cargo airplane engines, solely because it would cost too much for the cargo airplane engines to be repaired or replaced. Under this scenario, the only accident that actually took place involved a passenger aircraft, so, utilizing the methodology FAA used in its Initial Supplemental RIA in this rulemaking, FAA would not predict that there would be any accident caused by that engine aboard a cargo aircraft. Establishing the future benefits of a public safety rule based on a strict application of past accident history would unduly skew the BCA against checking/repairing/replacing cargo aircraft engines.

Failing to require repair/replacement of the engines in cargo planes would be an irrational, arbitrary, and capricious course of action by FAA. It is no less so when FAA embarks on this course when issuing regulations to protect against pilot fatigue than it would be to protect against engine failure.

Impact on Industry

It is appropriate to close with consideration of the purpose of a BCA – it is a guide to decision-makers in helping to determine if a proposed regulation is worth imposing on an industry for the benefits that will accrue. One factor to consider in this decision is impact of the imposed costs on the industry. Here, somewhat counter-intuitively, FAA has imposed costs on the passenger airline industry while exempting the cargo segment of the airline industry. The integrated freight segment, comprising 88% of the air cargo industry, has certainly been *very* profitable in the past decade.[192] The following charts depicting the number of pilots and the net income for cargo and passenger airlines graphically illustrate this point.

[192] *See* 2011 U.S. Air Carrier Reported Net Income (attached at Exhibit 32).



Thus, FAA's choice is between leaving cargo operations subject to 14 CFR Part 121 rules that FAA acknowledges are inadequate to protect against the dangers of pilot fatigue, or to include these operations, which are preponderantly conducted under conditions that involve a high risk of inducing pilot fatigue, within the scope of the Final Rule which Congress directed FAA to issue in order to combat pilot fatigue. The cargo industry can certainly afford to incur the costs that are realistically attributable to its compliance with the Final Rule, which will enhance safety for cargo operations and those passenger operations that share the airspace with cargo flights, as well as providing benefits to the public at large.

Recommended FAA Action

FAA should determine, for the reasons set forth above, that it has no authority to consider costs in this rulemaking, and, as a result, include cargo operations within the scope of the Final Rule. If FAA decides nonetheless to consider costs, FAA should revise the benefit cost analysis to correct the errors pointed out by IPA and to comply with applicable OMB and FAA guidance in the preparation of BCAs. Consideration of a realistic BCA, that

appropriately reflects both quantitative and qualitative benefits and is grounded in cost realism, should also lead FAA to determine that cargo operations should be included within the scope of the final rule, particularly because, as noted above, a Benefit Cost Analysis is to be a guide to decision-makers, not an "arithmetic straight-jacket."[193] This is a particularly important principle to adhere to when safety is at stake.

[193] Indeed, in the *Riverkeeper* case, where the Supreme Court held that the EPA was allowed to consider costs and benefits under its statutory mandate, EPA had promulgated a rule that had annual costs of $389 million, compared to annual benefits of $83 million***,*** for a net benefit of ***minus $306 million per year***. 556 U.S. at 224.