



DEPARTMENT OF THE AIR FORCE
45TH SPACE WING (AFSPC)

October 6, 2015

MEMORANDUM FOR SURFACE TRANSPORTATION BOARD
395 E STREET SW
WASHINGTON DC 20423-0001
ATTN: DAVE NAVECKY

FROM: 45 SW/XP
1201 Edward H. White II Street
Patrick AFB FL 32925-3238

SUBJECT: Data Request Letter -- Rail Line Extension to Port Canaveral, Florida
(STB Letter, August 10, 2015)

1. We have reviewed your request for information in the above-referenced letter concerning the proposed rail alignment 1c traversing Cape Canaveral Air Force Station (CCAFS) to the Port of Canaveral, and provide the following answers to your specific questions contained in paragraphs 1-5. Additionally, we have included further comments to the summary of considerations you provided in paragraph 6 to further explain and provide all currently known impacts such an alignment would have to both the operations at CCAFS as well as rail construction and rail operations.

2. In paragraph 1, you requested the following:

- a. The CCAFS bulletin on critical day designations.

45 SW response: See Attachment 1.

- b. Define the types of recurring closures that could preclude rail line construction or operation.

45 SW response:

(1) "Mission critical" or "no dig" days (which are synonymous terms) are types of recurring closures described in Attachment 1.

(2) Random and unpredictable real world security and natural/man-made disaster scenarios could result in both long- and short-term preclusion of rail construction and operations. Such events include but are not limited to, active shooter scenarios, increased Force Protection Conditions with associated Random Antiterrorism Measures, alarm activations at critical resources or arms, ammunition and explosive storage facilities, bomb threats or suspicious packages, major accidents, or hazardous operations. The specific location of any of these events, coupled with other factors; e.g., wind speed and direction, nature of the material, etc., would

affect the cordon and could preclude operations with no advance notice and for an indeterminate duration.

(3) Any use of communication or other electronic equipment radiating or receiving electromagnetic energy will have to receive an approved frequency allocation while operating on CCAFS. They will also have to adhere to radio frequency (RF) silence periods during times in which spacecraft payloads are being transported around CCAFS, or in some cases while the payload is on the launch pad. Depending on whether rail line construction crews or operators need to use the RF spectrum, and the particular frequency they would need to use, rail construction and/or operations could be precluded during these silence periods.

(4) Navy missile operations at the Trident and Poseidon Turning Basins invoke explosive safety quantity distance (ESQD) arcs on a periodic basis.

(5) Prelaunch and launch safety restriction zones could impact rail construction and operations. The areas include Pre-flight Blast Danger Area (BDA), Day-of-Flight BDA, Flight Caution Area (FCA), and Flight Hazard Area (FHA).

(6) Transport of launch vehicles, spacecraft or other flight hardware on Phillips Parkway (or any other roads used for such transport) cannot be interrupted or delayed by rail construction or operations.

(7) Depending on their location, prescribed burns have the potential to preclude or restrict rail construction or operations. They are the intentional ignition of grass, shrub or forest fuels to aid in control of vegetation or hazardous fuel loads to reduce wildfire threat, protect critical spaceflight infrastructure, and maintain habitat for burn dependent species such as the threatened Florida Scrub Jay.

c. Describe the nature of the restrictions or limitations that could be placed on freight rail movements on CCAFS property during critical days, no-dig days, and other types of closures or restrictions.

45 SW response: Our reply also includes restrictions or limitations placed on rail construction.

(1) For mission critical/no dig days, rail construction or movement could be prohibited or limited because of the proposed rail alignment's proximity to mission critical facilities or infrastructure. Various facilities operate mission critical electronic equipment that could be sensitive to ground vibrations. It is therefore prohibited to operate vehicles and equipment within the vicinity of these facilities that could create vibration during a critical period.

(2) For random and unpredictable real world security and natural/man-made disaster scenarios, rail construction and operations limitations or preclusions would be dependent on the circumstances. For example, a likely and potentially frequent possibility would be for an explosive alert at the commercial vehicle inspection facility just outside the south entrance to CCAFS near the port. This could shut down rail construction or operations and installation access with no advanced notice while the area is cordoned off and a properly trained response team is dispatched to render the area safe. Another example, albeit an extreme case, was in the aftermath of 9-11 when the installation was operating under Force Protection Condition Delta

and Charlie for more than 6 weeks, which significantly impacted operations and installation access. If such an event or similar elevated Force Protection Condition were implemented again, it is quite possible that rail construction or operations would have to cease or be severely limited during its duration. Unfortunately, the potential for a similar occurrence is real and cannot be discounted, especially in light of current threat levels and associated open source intelligence information. Additionally, we are required to exercise our response to both security and disaster event scenarios several times a year, which could hinder rail construction and operations during the running of the exercise.

(3) For RF situations, RF silence periods preclude use by rail operators and construction crews of a specified frequency as dictated by the spacecraft's requirements. Additionally, some spacecraft will request RF restrictions while on the launch pad, with the restrictions involving specific frequencies at certain levels. Pre-coordination, de-confliction and RF licensing will be required through the 45 SW Frequency Management and the Eastern Area Frequency Coordinator. Both offices require a 90-day lead time prior to any RF use.

(4) For Navy operations, rail construction and operations within and during any activated/invoked ESQD arcs would have to be curtailed unless exempted by the Department of Defense Explosive Safety Board (DDESB).

(5) For prelaunch and launch safety restriction zones, rail construction and operations within these areas would have to be curtailed while such zones are in effect.

(6) For transportation of launch vehicles, spacecraft, and other flight hardware, any construction on, or rail operations across a roadway used to get these assets around CCAFS will have to be curtailed while to ensure uninterrupted movement of these assets. Several transportation events occur using the South Gate heading north on Phillips Parkway.

(7) Due to smoke or potential fire hazards to train equipment and/or personnel, prescribed burns taking place near a 1c rail alignment may require curtailment of rail construction or operations during the burn.

d. Specify the duration of critical days, no-dig days, and other types of recurring closures or restrictions in hours. If these durations vary, what is the range of duration? What is the approximate average duration?

45 SW response:

(1) At a minimum, a mission critical or dig day is a 24 hour period. For launch operations, the critical period is the 24 hour period prior to the launch and the launch day itself. When a launch occurs on a Monday, the critical period is from the previous Friday through the launch day. For mission critical operations (Wet dress, Static Fire, capsule berthing), the critical period is normally the actual day of the event. The minimum duration of a critical period is 24 hours.

(2) Many real world security and natural/man-made disaster scenarios are too fact specific to provide accurate duration information. In the case of the explosive alert example in 2.c.(2) above, those events would normally last for several hours within a day, while the 9-11 example

lasted for more than 6 weeks. As for the exercises, they are normally of short duration (2-3 days or less), with impact to real-world operations either exempted or limited to a few hours, as the circumstances of the exercise dictate.

(3) RF silence periods during spacecraft transportation normally last less than one day, while silence periods or restrictions for spacecraft on the launch pad normally last 2-3 days.

(4) For Navy missile operations, ESQD arcs were enforced an average of 8 days per event. For miscellaneous ordnance operations (torpedoes, ammunition loads and general explosives), they averaged 5 days per event. However, for both, some events were of shorter duration while others were longer depending on the nature of the test or operation.

(5) Prelaunch and launch safety restriction zones can vary from minutes to hours, and in the event of an accident, could be potentially days.

(6) Duration of movement of launch vehicles, spacecraft and launch hardware are dependent on where they are coming from and going to, but most events would last less than 12 hours.

(7) Prescribed burns normally last all day between mid-morning and dusk, and anywhere from 1 to 3 consecutive days per area.

e. From 2005 to 2014, indicate the annual number of historical critical days, no-dig days, and other types of recurring closures or restrictions.

45 SW response: Note: In many cases, using past year actuals or averages would not provide good insight into future, anticipated closures. As many of these events are tied to the future launch manifest, we relied upon that in providing our response.

(1) From March 2014 to March 2015 there were 20 launch missions which yielded 103 critical or no-dig days. The expected manifest for future year launches is expected to average 25 or more missions.

(2) While real world security and natural/man-made disaster scenarios were limited in the time period from 2005-2014, the random and unpredictable nature of them make it difficult to rely upon as predictors of future occurrences. Exercise scenarios typically occur between 4-8 times per year, although the frequency can vary as well.

(3) For the upcoming twelve month manifest, RF silence periods based on spacecraft movements are expected to be 28. Spacecraft restrictions and silence periods at the launch pad are based on the payload itself, are not always invoked and are too unpredictable to provide accurate data as to future events.

(4) Between 2004 and 2014, six Navy missile operations were conducted in which ESQDs were in force. There were on average five miscellaneous ordnance operations per year in which ESQDs were in force.

(5) Prelaunch and launch safety restriction zones are invoked for every launch, including subsequent launch attempts following a scrubbed launch. The expected manifest for future year launches is expected to average 25 or more missions, and this does not include subsequent attempts following a scrubbed mission.

(6) We estimate approximately 50 surface highway movements per year of launch vehicle segments, satellites and other flight hardware in the area associated with the proposed rail alignment.

(7) In the past 10 years, CCAFS has averaged about 4 prescribed burn days per year; however, we expect the number to increase in the future.

f. If CPA or its designated rail operators were operating a rail line through CCAFS, specify how notification of critical days or other restrictions could be conveyed.

45 SW response: For critical and no-dig days, email via distribution of the CCAFS daily bulletin or by phone via the Cape Support Office. For RF situations, see 2.c.(3) above. For prescribed burns, the CCAFS Duty Office normally issues a 7-day, 3-day and 1-day advance notice. Prescribed burns are normally conducted on days when other mission critical activities are not scheduled. Similar communication methods would need to be explored between the rail operator and the 45 SW for other restrictions identified in 2.b. above. This would include a clear understanding of train schedules as far in advance as possible to assist both sides in avoiding, to the maximum extent possible, no-notice or late-notice closures and restrictions.

g. Provide a projection of future critical day designations and other closures. If there are specific projections for future years, please provide these.

45 SW response: The Navy expects a significant increase in operations in future years with its Strategic Weapon System Ashore (SWSA) and Ohio Replacement programs. This will bring about more ground and flight testing resulting in the activation of more frequent ESQDs and prelaunch and launch safety restriction zones. Future closures may also be affected by visiting submarines in the interest of national security. For other future closures, see answer to 2.e. above.

3. In paragraph 2, you requested:

a. a.i. The elevation above sea level of the radar antenna at the 45th Space Wing's Radar 19.14 facility.

45 SW response: Based on the GCM, the MSL height of KSC 19.14 is 11.25 meters. The geodetic height is -17.35 meters.

b. a.ii. The range of angles (relative to the horizon) and absolute bearing that the Radar 19.14 facility needs to be unobstructed to support launch operations.

45 SW response: The azimuth of support for current and near term launch activities is from 0-90 degrees. The angle of the radar at launch is slightly below 0 degrees to the horizon.

c. b.i. Describe any potential ISTEf operational concerns that would be associated with an operating rail line.

45 SW response was generated by information provided by the TISTEF Chief Scientist: The University of Central Florida has 4 operational concerns that are associated with an operating rail line in the proximity of TISTEF. These are: 1) diesel emissions; 2) train generated ground vibrations; 3) High Energy Laser hazards; and 4) security. See Attachment 2 for further details.

Note: ISTEf is now known as the TISTEF--Townes Institute Science and Technology Experimentation Facility

d. b.ii. The ISTEf location is in proximity to potential rail alignments other than Option A. Is the 45th Space Wing aware of other factors that OEA should consider in determining whether these alignments should be examined in further detail in the EIS?

45 SW response: See answer to 3.b.i. above and Attachment 2.

4. In paragraph 3, you requested the following matrix be filled out:

45 SW response:

45th Space Wing Facility on KSC	Avoidance Zone? (Yes/No)	Avoidance Zone Radius	Could rail construction and/or operation be precluded within Avoidance Zone?
Range Safety Radar 19.14*	Yes	5000 ft: 0-90 degrees 2000 ft: ** 300 ft: 90-360 degrees	Yes
Multiple Object Tracking Radar (MOTR)*	Yes	5000 ft: 0-90 degrees 300 ft: 90-360 degrees	Yes
Tel-IV Telemetry Site*	Yes	5000 ft: 0-90 degrees 300 ft: 90-360 degrees	Yes
ISTEF (operated by UCF)	Yes See attachment 2	5.5 miles See attachment 2	Yes See attachment 2

* The avoidance zones for radar 19.14, MOTR and Tel-IV are segmented based upon the need for line-of-sight to be unobstructed for 5000 feet as they point towards the launch pads and operate throughout the launch (0 to 90 degrees azimuth). The 300 foot radius for 90 to 360 degrees azimuth is based upon vibration and security concerns.

** Additionally, there is a boresight antenna located 2000 feet south of Radar 19.14 that requires round-the-clock uninterrupted line of sight access to the radar. Any rail alignment in between the antenna and radar 19.14 would interfere with this requirement.

5. In paragraph 4, you requested:

a. The potential processes for enabling the construction and operation of a freight rail line through CCAFS (i.e., processes for conveying a rail line right-of-way for use by CPA)? If an Enhanced Use Lease process was to be used, provide a summary of what the process entails.

45 SW response: A competitive EUL process would be used by the Air Force for enabling the construction and operation of a freight rail line through CCAFS. The EUL process contains several major steps, and is currently estimated to take between 24-36 months if all the necessary criteria for permitting such an endeavor are met and approved. See Attachment 3 for details.

6. In paragraph 5, you requested:

a. Since the beginning of 2010, how many times has the 45th Space Wing ordered the closure of the Banana River restricted zone?

45 SW response: The 45th Space Wing has not enforced the Banana River restricted zone based on increased threat or intelligence information since the beginning of 2010; however, it is enforced for every launch and launch attempt affecting Cape Canaveral Air Force Station. From 2010 to Present, there have been approximately 120 launches/attempts and the restricted area is typically closed 8 hours prior to the scheduled launch, although it varies based on mission parameters and could be longer; e.g., enforced 5 days prior to scheduled shuttle launches.

b. Typically, how much advance notice has been provided for these closures?

45 SW response:

(1) For scheduled launches, most are known and releasable to the public months in advance of the launch date. Additionally, at the time of release of the scheduled launch day and time, alternative dates in the event of a delay are announced as well; usually the day following the scheduled day. However, the actual decision as to when a subsequent launch attempt will be held will be made only after the launch has been delayed.

(2) For closures due to increased threat levels, those decisions are typically made without any forewarning or advance notice.

7. In paragraph 6, you requested:

a. The 45 SW confirm if all the listed considerations in paragraph 6 comprised all of the present considerations needed to be taken into account for the potential construction and

operation of a rail line on CCAFS, as well as the accuracy and completeness of those summarized considerations.

45 SW response:

(1) For considerations 6.a. to 6.k. (Environmental)--Concur

(2) For considerations 6.l. to 6.o. (Security)--Concur

(3) For considerations 6.p to 6.q. (Safety)--Concur with additional comments.

(a) Modify subparagraph 6.p.iv. to include the "Poseidon Turning Basin" in addition to the "Trident Turning Basin."

(b) Add a consideration "6.p.v." to read: "Current alignment 1c would require risk acceptance by the DDESB for Public Transit Routes ESQD violations."

(c) Add a consideration "6.p.vi." to read: "Exposure risk to CCAFS personnel, facilities and operations from rail mishaps must be evaluated."

(d) Add a consideration "6.p.vii." to read: "Transport of DOT certified hazardous materials would require analysis on impacts."

(e) Add a consideration "6.p.viii." to read: "Launch Vehicle and Spacecraft Transportation: Many launch vehicles and spacecraft require transit to processing facilities and launch complexes via the NASA Causeway or the South Gate, requiring the use of Phillips Parkway for many of those transport events. A rail accident in any of those areas could halt such transport and impact schedule.

1 Mishaps occurring just prior to, or during spacecraft transportation could affect spacecraft integrity, as well as schedule, as their transport is very time sensitive.

2 Mishaps occurring during flight hardware/explosives transportation introduces safety and security concerns, especially if a convoy becomes stuck in the middle of a route for extended periods of time."

(4) For considerations 6.a. to 6.i. (General and Operational)--Concur with additional comments.

(a) Modify the first sentence in subparagraph 6.a. to read: "Vibration impacts would need to be studied and addressed for mission essential facilities, equipment and operations, including those of the Navy, such as satellite and payload processing facilities, range operations facilities, munitions storage sites and testing facilities."

(b) Modify subparagraph 6.f. to read: "The presence of a rail line could have long-term impacts on future CCAFS development."

(c) Modify subparagraph 6.g. to read: "Train operation impacts, including vibration and line-of-sight requirements, would need to be taken into consideration on various mission essential facilities, including those of the Navy."

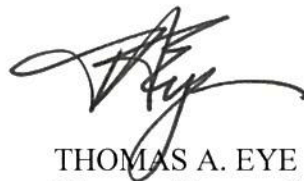
(d) Modify subparagraph 6.i. to read: "There could be safety, security, and operations impacts if a train were to stop and obstruct the Phillips Parkway near the southern end of CCAFS, to include impacts to traffic patterns."

(e) Add a consideration "6.j." to read: "Transport of launch vehicles, spacecraft and flight hardware over railroad crossings could introduce increased stress risk to these sensitive and extremely expensive assets. Damage to these assets could be both costly and delay launches of satellites for many months, if not years."

(f) Add a consideration "6.k." to read: "Railroad crossing signs and support structures would have to be designed to accommodate a variety of oversized loads using Phillips Parkway and any other roads on CCAFS traversing a 1c rail alignment."

(g) Add a consideration "6.l." to read: "CCAFS is a critical national asset relied upon to launch payloads vital to our national security. Any construction or operation of a rail line through it cannot disrupt its ability to serve this purpose."

8. We appreciate the opportunity to provide the requested information and hope it satisfies the needs of the Office of Environmental Analysis as it conducts its proceedings in this matter and stand ready to assist if additional information is required.



THOMAS A. EYE
Director, Plans and Programs

3 Attachments:

1. CCAFS Bulletin, 6 Mar 13
2. TISTEF Response
3. EUL Process

cc:

NASA KSC/AD

CAPE BULLETIN

Cape Canaveral Air Force Station, Florida

DATE: 6 Mar 13

NUMBER: 13-01

TO: All Cape Canaveral Air Force Station (CCAFS) Personnel

SUBJECT: Protection of Critical Infrastructure during Launch Critical Days Filing

INSTRUCTIONS: Cancels and supersedes all previous versions of the Cape Bulletin.

PURPOSE: This Cape Bulletin establishes procedures concerning protection of critical infrastructure during launch critical days designated by the 45th Space Wing.

SCOPE: This document applies to any entity or personnel conducting construction, transport or other support operations that may adversely impact a critical facility at Cape Canaveral Air Force Station.

DEFINITIONS

Excavate/Dig: Any modification to an existing grade or storm drainage profile by manual or mechanized digging, cutting, probing, trenching and all other penetrations to the surface/subsurface area to include compacting, installing tie down rods or driving grounding rods. (Backfilling of existing excavated sites will be permitted as long as undisturbed base is not affected.)

Dig Permit: The official document, issued by the Cape Support Office (CSO) after processing a dig permit request. Document must remain on the work site during excavation.

Underground Locate: The survey/study to locate underground utilities. This is not the actual excavation.

Dig Waiver: Authorization to conduct dig/excavation operations during critical periods, which deviate from assigned permit category. Waivers are issued verbally after approval by the Detachment 1 Commander, 45 MSG or a designated representative.

Work Clearance: An Air Force Form 103, Base Civil Engineering Work Clearance Request, as defined in Air Force Instruction 33-104, is processed for activities that may disrupt aircraft or vehicular traffic flow, base utility services (including communication), protection provided by intrusion detection alarm systems, or routine activities of the installation. These activities are determined by the Air Force Base Civil Engineering office. **A completed AF Form 103 is not considered authorization to excavate.** A signed Excavation Permit is the only official Document authorizing excavation. Damage to underground power cables and communications lines continue to happen during digging operations on normal and critical days. These incidents emphasize the absolute requirement for everyone to obtain a Base Civil Engineering Work Request Air Force Form 103, from Civil Engineering prior to any excavation

operation.

Launch Critical Days: Days specifically designated by an operation (e.g. launch, processing, fueling, etc.) which could restrict work activities that may adversely impact mission essential facilities at Cape Canaveral Air Force Station. Launch Critical days are designated by program and are listed in the next section of this document. Work restrictions (as defined below) may apply to operations during these periods. These periods may be determined by contacting the Cape Support Office at 853-5211, 24 hours a day.

Oversized Loads: Loads which exceed any of the following dimensions: 75ft long X 12ft wide X 18ft height.

Work Restrictions: A work prohibition will be in effect during launch critical days which prohibits the following: Excavation/digging (Cape wide), vibratory ground operations (to include compaction), power system switching (both Cape wide power distribution system and any electrical system in a critical facility), water distribution system reconfiguration or valve operation (applies to both Cape wide system and critical facility supply lines), major construction activities in and around (within the facilities perimeter) a designated critical facility including but not limited to; modifications to the facilities building systems, heavy equipment/machinery operations, modification to any electrical, control, or utility system supporting a critical facility. Movement of oversize loads on the roads or any activity that may adversely impact a critical facility.
Note: To avoid traffic in the area of the SpaceX launch center, the CCAFS Space & Missile History Center will be closed and 45 SW public tours will meet/organize at an alternate location on SpaceX-designated critical days.

I. CRITICAL DAY DESIGNATION BY LAUNCH PROGRAM

A. Atlas V EELV Program: Wet Dress Rehearsal: 1 day prior, day of test, 1 day after; Launch: day prior to launch/(L)-1 day and launch day.

B. Delta IV EELV Program: Wet Dress Rehearsal: day of test; Launch: day prior to launch/L-1 day and launch count to include launch day.

C. SpaceX Program: Wet Dress Rehearsal: day of test; Static Test Fire: day prior to and day of test fire; Launch: day prior to launch/L-1 day and launch day (to T+6 hours). Dragon/ISS mission additions: day approaching ISS, day of docking and day of ISS separation through splash down.

D. Trident & Special Ops: Launch: day prior to launch/L-1 day and the launch count to include launch day.

E. New Launch Program: New Launch programs will be coordinated as they begin planning and operating on the range. (Suggest a form letter should be provided to new programs to request temporary amendments to the bulletin upon approval by the Det 1/CC, 45 MSG.)

II. Weekend Critical Day Rule. When launches or static fires are scheduled for weekends or Mondays, the previous Friday will be considered the L-1 Day as the weekend days will be critical.

III. Critical Day Waivers will not be allowed without verbal permission via the Cape Support Office from the Det 1, 45 MSG with a written follow-up faxed to the Det 1/CC, 45 MSG at 853-4510. Requests for critical day waivers should be submitted to the Cape Support Office for verification and coordination with the Det 1/CC, 45 MSG or the designated representative. The minimum information required for waivers is permit or outage number as applicable, location, description, justification, date and time, completed utilities and communications surveys and approved route surveys for oversized loads. Waivers may be submitted and pre-approvals granted up to 3 days in advance. Cape Support Office will contact the requester with approval or disapproval status.

A handwritten signature in black ink, appearing to read 'James R. Sayres III', with a stylized, cursive script.

JAMES R. SAYRES III, Lt Col, USAF
Det 1/CC, 45 MSG

2.b.i. Although the ISTEf is operated by the University of Central Florida (UCF), based on your understanding of the facility, please describe any potential ISTEf operational concerns that would be associated with an operating rail line.

ISTEF Operations and Facility:

ISTEF is a science and technology experimentation facility conducting research for laser and optical systems applications for operation through the open atmosphere. The research and applications include High Energy Laser weapons, laser point to point communications, laser radar, laser based remote sensing and passive optical imaging. The targets and objects include ground objects, airborne platforms and space-based platforms. The distances and ranges over which the research is conducted are: 1km/0.6mi (ISTEF Range), 13km/8mi (TISTEF to VAB roof), 5km/3mi (along SLF runway), 10km/6mi (ISTEF to airborne platform and 400km/250mi (ISTEF to Space Station). The research, testing and experimentation, is supported by Departments and Agencies of the Department of Defense. The operations budget typically runs \$3.0 to \$3.5 million per year in addition to UCF's support for facility operation and maintenance of \$100 thousand per year.

The facilities at ISTEf are 4 buildings that house instrument storage another that houses the mechanical shop, electronics shop, experimentation control room, offices, the third building houses the laser laboratory and the forth is a domed building housing the space telescope. In addition to these building are two mobile laboratories, deployed for remote field operations. The testing and experimentation at ISTEf in conducted both day and night. ISTEf is cleared for Department of Defense Secret operations and research.

Operational Concerns

University of Central Florida has 4 operational concerns that are associated with an operating rail line in the proximity of ISTEf. These are: (1) diesel emissions, (2) train generated ground vibrations, (3) High Energy Laser hazards, (4) security.

(1) Emissions

The emissions from diesel locomotives that are of primary concern to the operations at ISTEf are the particulate matter emissions. For long haul locomotives (of the order of 3,000 hp), these can vary from 1 μ m to 10 μ m in size, with concentrations of 0.142 μ g/m³ (Ref.1). This is of the size locomotives to be used at Port Canaveral (Ref. 2). These particles can also agglomerate with ocean aerosols to be of the order of 20 μ m in size with a density of 0.142 μ g/m³.

The range of wavelengths of the lasers used at ISTEf is 0.4 μ m to 2 μ m. Hence the ratio of particulate diameter to laser wavelength is from 50-to-1 to 10-to-1. This would give rise to strong scattering of laser beams. The scattering would prevent beam to be focused on a target. The experimentation at ISTEf would be severally degraded if the rail line were within several miles of the facility.

(2) Vibrations

The vibrations from two locomotives were measured at 3 sites at various distances from the rail line. The conditions of the September 25, 2014th tests were dry and the sandy soil was dry (Ref. 2). The peak vibrations were measured at various distances from the rail line. The measurements

were plotted as a function of a distance on a log-log plot (Ref.2, Fig.4). An exponential mathematical equation was created to match the plot. The amount of vibration the ½ meter could tolerate for tacking with an error that would be below a measurable amount. Based upon that analysis of the experimental data and the mathematical analysis, the rail line could be no closer than slightly less than 5,280 feet (1mile). If the sandy soil was wet the vibrations would be transmitted through the soil more and the tolerable distance would be extended. Since there is no experimental data at this time, the distance would be only based upon theory.

(3) Laser Hazard,

The lasers used at ISTEf have been evaluated by the Radiation Protection Program at Kennedy Space Center (Ref. 3). The lasers at UCF's ISTEf were evaluated for Ocular, Nominal Ocular Hazard Distance - NOHD and Skin, Nominal Skin Hazard Distance, safety for lasers at various wavelengths and powers. For the current lasers the minimum radius distance for both criteria is 8,820 meters or 5.5 miles. The lasers to be used within a year are of the power of 10 kilowatts with a NOHD of 250,000 km. These High Energy Lasers, HEL, and our proposed procedures have not yet reviewed by the KSC Radiation Protection Program. Experimentation with these lasers will take place both day and night.

(4) Security

The ISTEf facility is cleared for Department of Defense Secret. All areas of the facility are under 24/7 camera monitoring. Although the buildings are fenced-off, the 1 km laser range is not. Access to the ISTEf area is through TEF-4 Road. The road is locked-off at night and patrolled by KSC Security. That is to prevent unauthorized persons any potential access to the area near ISTEf. Slow moving train cars anywhere near ISTEf would certainly give easy access to the ISTEf facility.

References

1. "Monitoring diesel emissions from a locomotive at the rail yard in St. Joseph Missouri", M. Mandegar, Ph.D. dissertation, School of Environment, Physics and Applied Science and Safety Sciences, University of Central Missouri, August 2012.
2. "Vibration Monitoring Results – Test Program", J. C. Adams, TranSystems Corporation Consultants, 4500 Salisbury Road, Suite 440, Jacksonville, Florida, November 2014
3. "Radiation Protection Program Approval of Radiation Use Authorization Radiation Protection, No: K-LA-50140 Modification 022." Rod Nickell, CLSO, Health Physics Supervisor, August 4, 2015

2.b.ii. The ISTEf location is in proximity to potential rail alignments other than Option A. Is the 45th Space Wing aware of other factors that OEA should consider in determining whether these alignments should be examined in further detail in the EIS?

Other factors

1. The emissions from diesel locomotives depend upon the speed of the locomotive. Research literature on the subject is available, e.g., Ref. 1. A more complete analysis should be conducted, considering such factors as local wind speed and direction, sea aerosol agglomerate with soot.

2. The measurements made at KSC in 2014 were when the sandy ground was dry. The vibration measurements should be conducted when the ground was wet. The ground is more “solid” when wet and transmits high frequency vibrations better than dry sandy ground. In addition, an analysis and modeling should be conducted of a train of loaded rail cars generated vibration
3. Procedural models for area security should be generated and analyzed. The models should be reviewed by the Air Force facility personnel and Air Force Security.

4. What are the potential processes for enabling the construction and operation of a freight rail line through CCAFS (i.e., processes for conveying a rail line right-of-way for use by CPA)? If an Enhanced Use Lease (EUL) process would be an option, provide a summary of what the process entails.

The following processes represent the major actions necessary for a successful EUL:

- A. 45 SW/CC must declare the affected land is:
 - i. Not being used by the Air Force and is not needed for other military purposes;
 - ii. The intended use as a rail line does not interfere with the mission at CCAFS;
 - iii. The intended use is compatible with the AF needs, security, and safety;
 - iv. Is under the control of the SAF/IEI;
 - v. Is not considered excess property.
- B. AFCEC/CIU (Air Force Civil Engineer Center) staffs such a declaration to SAF/IEI (Deputy Assistant Secretary of the Air Force (Installations)) for a final determination and to insure SAF/IEI considers such a lease advantageous to the U.S. and promotes national defense.
- C. After receiving a determination from SAF/IEI, AFCEC/CIU engages 45 CES/CEI to review the land parcel(s) for how a rail line might possibly impact each of the following categories of concern:
 - i. Threatened and endangered species
 - ii. Critical habitat
 - iii. Cultural/historic preservation sites
 - iv. Wetlands
 - v. Floodplains
 - vi. Installation Restoration Program (IRP) sites
 - vii. Imaginary Surfaces
 - viii. Quantity Distance (QD) Arcs
 - ix. Firing Range Safety Fans
 - x. Training Range Setbacks
 - xi. Air Installation Compatible Use Zone (AICUZ)
 - xii. Antiterrorism (AT) Setbacks
 - xiii. Security/Access Requirements
 - xiv. Radar Setbacks/Clear Zones
 - xv. The Installation Development Plan (IDP)
 - xvi. Future Mission Restrictions
 - xvii. Encroachment Management
 - xviii. Highway and road use restrictions
 - xix. Planning and Zoning
 - xx. Legislative Jurisdiction
 - xxi. Encumbrances (Existing easements, right-of-ways, etc.)

- xxii. Topography
- xxiii. Soil Conditions
- xxiv. Infrastructure (electricity, communications [telephone, fiber optics, communication towers, etc.], natural gas, sewage, storm drainage, & water).
- D. An Environmental Baseline Survey would also be required on each parcel to provide a potential developer with a snapshot of the environmental condition of the property at the time of the transaction.
- E. The proposed EUL opportunity would be briefed to the Strategic Basing and Encroachment Management Board for concurrence.
- F. Assuming any potential impacts from a rail line can be minimized, and/or mitigated, the opportunity would be competed per 10 U.S.C. § 2667 with the intent to receive fair market rental value, based on an approved appraisal. The competitive process is normally accomplished through a Request for Qualifications (RFQ) on fbo.gov.
- G. Prior to competition, Congressional Notification would be required per 10 U.S.C. § 2662.
- H. Upon completion of the RFQ process, all offers would be reviewed by a Source Selection Evaluation Board and a Highest Ranked Offeror (HRO) would be selected. The HRO selectee would then be recommended to AFCEC/CI and the Executive Steering Committee for approval, prior to being briefed to SAF/IEI for final approval.
- I. Once approved, negotiations would commence with the HRO and the lease documents would be developed. During this step, the NEPA process could also proceed; typically at the expense of the HRO.
- J. Once lease negotiations are complete, the EUL would be sent to SAF/IEI for approval and signature.
- K. Due to the scope of complexity associated with this particular endeavor, an estimated overall timeline would be in the range of 24-36 months.