

Causal Analysis Report for “Demolition of Historic and Yet-to-be-Determined Radar Towers at TTR Without Completing Required NEPA Process”

Occurrence NA-SS-SNL-4000-2018-0002

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Summary of Event and Root Cause Analysis

Two radar towers at the Tonopah Test Range (TTR), Contraves Towers 22-00 and 12-00, were torn down prior to completion of the required National Environmental Policy Act (NEPA) process.

National Technology and Engineering Solutions of Sandia, LLC, (NTESS) submission of the NEPA checklist triggered a Sandia Field Office (SFO) review of the proposed work scope and was to include a required consultation between SFO and the Nevada State Historic Preservation Office (SHPO) to assess any adverse effect(s) on historic properties or contributing element(s) to a historic district and, if so, determine a resolution. Following the consultation, SFO provides approval/denial of the proposed work detailed on the submitted NEPA checklist. Contraves Tower 22-00 is a historic structure, as formally determined by the SFO in consultation with the SHPO. The historical eligibility of Contraves Tower 12-00 is yet to be determined. On February 13, 2018, NTESS notified SFO that Contraves Tower 22-00 at TTR was torn down in May 2017 prior to completion of the required the NEPA process, including consultation with the SHPO.

NTESS submitted two NEPA checklists to SFO in 2016 for the removal of several structures no longer required by NTESS. The first NEPA checklist listed three historic structures (one of which was Contraves Tower 22-00) and SFO determination on whether consultation with the SHPO is necessary as well as approval/denial of the NEPA checklist is pending. The second NEPA checklist listed five non-historic structures, one of which was Contraves Tower 12-00. SFO approved the NEPA checklist covering non-historic structures except for the Contraves Tower 12-00, as the Contraves Tower 12-00 requires further consultation with the SHPO by SFO. Only after completion of the consultation would SFO determine approval/denial on the remaining property cited within the NEPA checklist. In late January 2018, NTESS personnel discovered that Contraves Tower 22-00 was no longer listed in the Facility Information Management System (FIMS). Upon further investigation, NTESS personnel verified that the Contraves Tower 22-00 had been removed in May 2017. During the initial extent of condition, it was discovered that Contraves Tower 12-00 had also been torn down in May 2017 as part of this same destruction and demolition (D&D) activity. Both Contraves Towers 22-00 and 12-00) had been torn down prior to completion of the NEPA process, including consultation with the SHPO.

The issue statement from which the Causal Analysis Team focused was:

“Two Contraves Towers that are "historic" or "to be treated as historic" (#22-00 and #12-00) were torn down without all required approvals completed.”

The impacts of this issue are:

- Reportable occurrence under DOE Order 232.2A *Occurrence Reporting and Processing of Operations Information*, reporting criteria 5B (1)-
“Any occurrence including releases causing significant impact to ecological or cultural resource for which DOE has responsibility under applicable laws, regulations, and

Executive Orders. For example, extensive damage to, or destruction of...d. Historical/archeological sites”

- Non-compliance with ESH100.EP.2 *Implement NEPA, Cultural Resources, and Historic Properties Requirements*. Specifically, the requirement to,
“Proceed with the project only after the following occurs: Notification that the NEPA review is complete and has been received and identified requirements or limitations have been incorporated into the project.”
- Potential unallowable costs
- Potential damage to the relationship between SFO and SHPO and
- Potential damage to the relationship between NTESS and DOE/NNSA/SFO.

The root cause analysis was performed in two parts. First, fact finding and issue discovery were performed through a combination of interviews with involved Sandia National Laboratories (SNL) personnel and review of the work acceptance documentation package required by the integrated safety management system (ISMS). Document review included the following work authorization related documents for this project¹:

- Project Charter- *TTR D&D (09-18, 02-00, 02-01, 02-51, 12-00, 19-00, 21-00, 22-00,23-20)* dated September 8, 2016
- Universal Construction Package (UCP)- *TTR Structure Demolition* dated January 23, 2017
- Project Authorization- *TTR Structure Demolition* dated March 23, 2017
- NEPA NM16-0081 *TTR D&D – Miscellaneous Indirect Funded Non-Historic Buildings*
- NEPA NM16-0090 *TTR D&D – Miscellaneous Indirect Funded Historic Buildings*

Additional discovery information was provided by interviews of the D&D Program Manager, D&D Project Manager, the corporate historian, and the NEPA subject matter expert who discovered the towers had been torn down. The second portion of the analysis consisted of two team meetings where a timeline analysis and cause and effect mapping analysis were conducted to determine the causes which contributed to this issue. The use of these two methods revealed the following causes that contributed to this event:

- Segregation of facilities projects by "historical" vs. "non-historical" is not normal practice as there are few projects where this kind of differentiation would be applicable.
- The Rationale section, where the caveat instructions excluding the approval for destruction of Contraves tower #12-00 was on the last page of the 15-page checklist.
- The Rationale paragraph included in autogenerated emails from the NEPA application are typically standard verbiage and do not usually do not include caveats or approval exclusions.
- Forms filled out by D&D Program Manager are viewed through the lens of real estate and financial compliance not environmental, safety, and health (ES&H).

¹ For a complete list of all documentation reviewed, reference [Discovery Documents Folder for NA-SS-SNL-4000-2018-0002](#).

- Procurement process assumes that all previous steps (including NEPA checklist completion) are accurate and complete.
- The Universal Construction Package (UCP) template used at the time of this project did not include specific NEPA information.
- Project authorization includes an area to list NEPA numbers, but does not prompt verification of checklist completion.
- An alternate forum to the monthly SFO NEPA meeting was not successfully established to provide NEPA status updates to facilities.
- Multiple projects are expected to be accomplished during a small annual window of opportunity at TTR.

Immediate Actions

The following immediate actions were taken as a response to this event.

1. NTESS management and SFO were notified.
2. D&D project work for Askania Camera Tower 02-00 and Tracking Telescope Dome ME-16 02-01 (within the scope of NEPA checklist NM16-0090), were verified as on-hold until the NEPA checklist was completed.
3. A fact-finding critique was held on February 19, 2018.

Timeline Description of the Event

In **2005**, SNL personnel completed a historic building survey and assessment of TTR. The survey was done in response to previous rounds of demolition to clean up unused properties at TTR, and included required historic building assessments and the understanding that TTR might undergo improvements, renovations, and additional demolition activities in the coming years. The assessment recommended that 59 of the properties at TTR were eligible for the National Register of Historic Places (NRHP) as a historic district. The proposed SNL TTR Historic District included properties that represented the key TTR capabilities and activities over the course of the range's Cold War history. The properties included Contraves Tower 22-00, but not Contraves Tower 12-00. Contraves Tower 22-00 was included as it was the most intact of the remaining Contraves Towers at the site and represented the use of fixed instrumentation for data capture in testing.

It is the responsibility of the owning or permitting agency (in this case DOE/NNSA/SFO) to determine whether a property or set of properties is eligible for the NRHP and therefore historic. SFO must do this in consultation with the State Historic Preservation Officer (SHPO) of the state in which the property is located. If a historic property is threatened (damaged, renovated, demolished) by any activity, SFO must consult with SHPO regarding proposed mitigation of the threat and SHPO must agree that the mitigation is sufficient prior to the beginning of the proposed undertaking. In the case of TTR, SNL personnel are the proponent applicant requesting authorization to undertake activities and SNL personnel cannot proceed without SFO authorization. SNL personnel proposes activities and receives authorization via the NEPA process—a completed NEPA checklist includes SFO's approval to proceed.

The TTR historic building and assessment was originally completed in 2004 and SFO consulted with Nevada SHPO regarding the proposed historic district and expected demolition of properties at the site in the coming decade. SHPO questioned the credentials of SNL's historian, prompting SNL personnel to hire a partner firm to revisit the survey and assessment with the historian. This resulted in the 2005 survey and assessment, which recommended 59 properties as a Historic District.

Between **2005 and 2011**, SHPO and SFO discussed the Historic District (adding one building to the district, bringing it to 60 properties) and the details of the district's boundaries. On August 19, 2011, a letter was sent from Nevada SHPO to NNSA/SFO. In the letter, SHPO concurred with both the boundaries and eligibility of the SNL proposed Historic District, noting that the district met criterion G, "A property achieving significance within the past 50 years if it is of exceptional importance." It is unclear who at SNL should have received a copy of the letter, if anyone. SNL personnel acquired a copy of this letter later only because the SNL historian requested it. In the appendix of the letter, Contraves Tower 22-00 is listed as part of the Historic District, Contraves Tower 12-00 is not. SHPO additionally requests three more items in the documentation package:

1. A 7.5-minute map at 1:24000 scale for both survey and historic resources,
2. SNL construction drawings, and
3. Page one of the Historic Resources Inventory Form for structure 09-32, S347.

The only means of SNL personnel learning of these additional requests, are through a monthly NEPA meeting with SFO or through direct requests from SFO to the relevant subject matter expert (SME), in this case, the SNL historian.

Over the next several years, consultation between SFO and SHPO continued sporadically, focusing on proposed alterations to Building 03-56 at TTR and on establishing a Memorandum of Agreement (MOA) regarding the SNL TTR Historic District. An MOA was established for the renovation of Building 03-56; the MOA required preparation of a Historic American Buildings Survey and the Historic American Engineering Record (HABS/HAER) documentation package of the building prior to its renovation. That documentation was completed and revised per SHPO's request, but was not formally accepted prior to the MOA's expiration. Anticipating the same requirement for proposed demolition of historic properties at TTR, documentation were prepared for those properties as checklists were submitted. However, an MOA for the historic district has not been finalized.

In **2014**, a fiber optic installation occurred at TTR. During this project, the archeologist performing a survey recommended that structure 12-00 be considered for the National Register of Historic Places and therefore historic. During consultation on the fiber optic project, SHPO and SFO agreed to not address the eligibility of Contraves Tower 12-00, as the immediate project did not affect it. Its historic status remained undetermined at this point.

In **2015**, an indirect funding stream was allocated for D&D including structures at TTR. A project charter for TTR D&D was developed to take advantage of this newly identified funding. There was some difficulty keeping track of the scope of the project because negotiations between TTR management and facilities concerning priorities for demolition went back and forth. At that time, space (including structures) was owned by line organizations and not Facilities. This allowed for decisional authority of what stays, what goes, and when to be determined by the line organization that owns the structure. The line organization changed the list of structures to be demolished several times.

On **July 29, 2015**, an Excess Real Property Report was released. This report is part of the request for disposition package needed for project authorization to proceed. The request for disposition package requires two people to oversee this complex process to ensure all documentation is in place. On the Facilities side, the Project Manager is responsible for multiple ES&H requirements, such as the Contract Specific Safety Plan and NEPA checklist, and the Financial Program Manager is responsible for completing all paper work necessary to coordinate both the real estate disposition and coordination of funding with DOE headquarters. The complexity of this undertaking "takes 12 pieces of paper on just the disposition program side (real estate)." To keep track of this parallel process from Facilities and Financial program management, the D&D Program Manager and the D&D Project manager meet monthly to discuss status.

On **November 20, 2015**, the bi-annual Facilities Information Management System (FIMS) Reconciliation Report was issued. FIMS is the required DOE database for official real estate holdings. SNL has approximately 550 structures in this database that are categorized as "other structures" because they

are non-occupiable and have no square footage. The two Contraves Towers 12-00 and 22-00 were listed in FIMS during this reconciliation.

In **December 2015**, the Real Estate portion of the Request for Disposition was completed. The process requires that structures are screened for suitability to reallocate buildings for use as homeless shelters. Once the screening has occurred, after 20 days the waiting period for D&D is exhausted. The second real estate process evaluates the property through a Title V survey. This survey is a standard form checklist issued by Housing and Urban Development (HUD). The form is filled out by the D&D Program Manager but completed by the NNSA Realty Specialist. The survey does note that DOE review is contingent upon “favorable NEPA review” and has a question that asks explicitly about known environmental conditions, including historic properties. The D&D Program Manager answered this question as “no.” The D&D Program Manager’s focus and expertise includes financial and real estate requirements. Responsibility and subject matter expertise related to ES&H requirements, including NEPA requirements, is assigned to the Facilities D&D Project Manager, who is not involved with the completion of the HUD required forms.

In **January 2016**, NEPA checklist NM16-0081 *Miscellaneous Indirect Funded Non-Historic Buildings* was created. It was submitted for SME review on February 2, 2016, and submitted for DOE review on February 18, 2016. That NEPA checklist was completed and approved on April 4, 2016. There was an unusual caveat listed in the rationale from SFO on pages 11 and 15 of the 15-page checklist. The recommendation to set aside Contraves Tower 12-00 from the fiber optic cable project brought up during the 2014 archeological survey, was included as a caveat stating that Contraves Tower 12-00 was still in need of SHPO consultation and was not approved for D&D. The issue identified in 2014 was not settled and SFO did not complete consultation with SHPO regarding Contraves Tower 12-00. The caveat referencing Contraves Tower 12-00 in this NEPA document went unnoticed. This could have occurred for several reasons including:

- Email notifications include rationale but usually the rationale statement is standard verbiage that does not include significant exceptions or restrictions.
- There were numerous NEPA checklists, managed by the Project Manager, that were either in SME or DOE review.
- The checklist format, at the time the project occurred, placed rationale notes in the last section on the last page.
- It was extremely uncommon—not remembered by any of the team members as ever having occurred—to have an approved checklist with any sort of caveat or exclusion.

In **February 2016**, NEPA Checklist NM16-0090 *Miscellaneous Indirect Funded Historic Buildings* was created in the NEPA system. On May 10, 2016, the checklist was submitted for DOE review. This checklist has not yet been completed because the required Nevada SHPO consultation with SFO had not yet been satisfied through an approved HABS/HAER documentation package.

The unusual circumstances of the Historic District at TTR and the unclear path forward for dispositioning the structures covered under this NEPA are difficult and frustrating, and SNL personnel had very little influence over the outcome. Telephone inquiries from the project manager to the NEPA team resulted in frustration because most status updates from the NEPA SMES were “no update.” The NEPA SMEs provided this response because the information provided to the NEPA team from SFO was either “no update” or not relevant. The large volume of NEPAs that need to be reviewed by a single SFO staff member as well as additional responsibilities result in slow checklist completion if there are any unusual circumstances, such as cultural or historical resources involved. Although there is a monthly forum between SFO and the SNL NEPA team that Facilities used to attend to help them stay apprised of the status of their NEPAs, the Facilities team was removed from the meeting attendee list due to need to know concerns regarding NEPAs not owned by Facilities. An alternate forum to the monthly SFO NEPA meeting was not successfully established to provide NEPA status updates. Updates from the NEPA system itself are also “silent” post submission unless the NEPA checklist is about to expire. This could mean that no notification of status from the system may occur for two or three years, depending on the duration of the NEPA as described upon submission of the checklist.

On **September 8, 2016**, a Project Charter was drafted. Three confirmed historically eligible structures and one more possible historically eligible structure was included within the scope of the charter. The charter scope for D&D included Contraves Towers 12-00 and 22-00. The charter also included structures 02-00 Askania Camera Tower, and 02-01 Tracking Telescope Dome ME-16, which were also covered under the incomplete NM16-0090 NEPA checklist. There was no effort in this charter to segregate the historic from non-historic structures because this was not the normal practice as there are few projects where this kind of differentiation would apply. Critical segregation is usually based on the geographic area of multiple structures or segregation of real versus personal property for Facilities D&D projects. Contraves Tower 12-00 is not approved for D&D under NEPA NM16-0081 due to the caveat restriction covered in the rationale section in the checklist, and Contraves Tower 22-00 is not approved for D&D because the NEPA NM16-0090 checklist is still under DOE review and not yet complete.

During this time, Facilities was under extreme pressure to get contracts issued. Newly identified deferred maintenance funding was made available and had to be spent within one fiscal year. This new funding added \$47 million of additional project work on top of regularly scheduled activity. Pressure to spend the funding came from SNL executive management as demands to show program progress before the M&O contract change on May 1, 2017. The pressure was so intense that individual project managers and the NEPA team received direct calls from executive management demanding that projects be fast tracked.

In **January 2017**, the TTR Demolition Universal Construction Package (UCP) was developed. The UCP template used at the time of the project did not include information regarding NEPA checklist approval by DOE because the sub-contractor is not responsible for ensuring the checklist has been approved. They are only responsible for implementing the items that SNL personnel have indicated need to be addressed, per the NEPA checklist approval. The purpose of the UCP is to provide potential bidders the scope of work of the project, as well as any associated site and special conditions, to allow potential bidders to submit a cost proposal through the full procurement process. The UCP listed both Contraves

Towers 12-00 and 22-00. A typo on the Business Opportunities Website (BOW) states that there are three cylindrical steel towers, but has a table that lists four, including Contraves Tower 22-00. The UCP does state specific conditions regarding a requirement to have a completed NEPA checklist, but specific numbers are not referenced in this document. The UCP was also generated out of the normal sequence to get a better estimate of cost before project authorization due to the unique challenges regarding both the location and type of structures within scope.

Time pressures continued to build as the UCP was put together. Still looming were M&O transition uncertainties and pressure to show progress. Additionally, spring is the peak season of facilities work at TTR. There is a brief time window between when money arrives for projects and when work must stop so that the TTR test schedule is not impacted. In addition to this time pressure, multiple projects including two roof asset management program (RAMP) projects, a fire alarm project, and a communications project also needed to be completed on the test range within the available window.

From **January to May 2017**, the procurement process was underway. The statement of work was not revisited during this time. There was no recognized trigger to review the statement of work prior to project authorization and all was assumed to be correct. The normal process flow occurred, the estimates from bidders were in alignment with the project cost estimate, and funding was being watched and spent according to the project schedule.

On **March 23, 2017**, the Project Authorization from the Facilities process was finalized. Both Contraves Towers 12-00 and 22-00 were included in the structure authorization list. To differentiate the historical from non-historical, three items were written in red font with a sentence highlighted in yellow after the list that read "Items in RED are considered historic and are waiting for NV SHPO consultation and SFO approval of a separate NEPA checklist." The number of the separate checklist was not given and it was not listed in the field with NEPA NM16-0081. The caveat excluding Contraves Tower 12-00 was not listed as the field only asks for the number, and that tower also was not separated in structure scope list in red font.

Several factors affected the precision of the Project Authorization. The fact that there were so many structures with different statuses, different funding streams, and a lot of fluidity, made merging the authorizations a struggle. The authorization was also started in draft form at the beginning of the project in 2015. This occurred before the two separate NEPAs were submitted. The authorization draft was a direct "cut and paste" from the project charter and was added without a contractual hold point, as that need was unknown at the time it was created. Although a note and red text call outs were used to call attention to the three historic structures included in the list, NEPA NM16-0090 was not verified as complete by the D&D project manager.

The project manager had significant distractions that may also have affected documentation precision. During the time the project authorization was being developed, there was a tank overflow event and a tight turn around magnetically insulated vacuum transmission lines (MITL) project. The MITL project required that work be accomplished over a 10-day period with two shifts working straight through the

time available. This was done to accomplish the Facilities work without interrupting line operational work in Division 1000.

On **April 6, 2017**, the Purchase Order was approved and the Tonopah Test Range Structure Demolition Project was underway, as called out under the contract terms and conditions. Clauses in the contract in place included provisions for the notice to proceed and contract specific safety plan, but the template version used did not include NEPA completion provisions. The UCP template dated January 3, 2018, does include the NEPA completion provision. The work under this contract was awarded on April 6, 2017, and has a completion date of May 31, 2018.

The Notice to Proceed was issued on **April 21, 2017**. This is the point in time where the NEPA errors became irreversible defects. The only verification that occurred before the Notice to Proceed was issued was that the sub-contractor had completed required asbestos and hazardous materials handling training. The TTR D&D work occurs from **May 2 to May 10, 2017**.

In **January 2018**, the SNL Historian prepared for the bi-annual Facilities Information Management System (FIMS) reconciliation and annual DOE audit of FIMS. The historian notices that Contraves Tower 22-00 is not in the FIMS database. The NEPA team is scheduled to visit TTR the following week, unrelated to this project. The Historian requests that the team try to verify if the structure still exists while they are onsite. On **February 6, 2018**, the NEPA team confirmed that the structure no longer existed. On **February 13, 2018**, upon returning to New Mexico, a member of the team informed their Senior Manager of the situation.

The Senior Manager recognized that this situation met the criterion of Occurrence Reporting Requirements and started the reporting process. The Senior Manager also recognized that the situation met the reporting criterion categorized as “high,” per 5B (1), “Any occurrence including releases causing significant impact to ecological or cultural resource for which DOE has responsibility under applicable laws, regulations, and Executive Orders.” When an event meets any “high” categorization criteria, the event is required to be categorized within 2 hours and reported to DOE within 4 hours. Due to the time constraints involved and questions related to who would ultimately own the event, normal process was not followed. A decision was made to categorize and report before identifying a responsible manager to meet DOE order reporting requirements. The event responsible manager was identified on **February 15, 2018**, and the initial Occurrence Reporting and Processing System (ORPS) notification was entered into the required DOE system on **February 15, 2018**. The event fact-finding critique was held on **February 19, 2018**.

Extent of Condition

On **February 21, 2018**, during the information discovery phase of this event preparing for the causal analysis, an additional Contraves Tower 12-00 was confirmed to also meet reporting criterion. Although the reporting criteria involved for this tower would not be “high”, it would meet management concern criterion, D&D was conducted under the same project and contract. On **February 22, 2018**, SFO agreed to combine the two events into a single Occurrence Report. On **March 1, 2018**, an amended ORPS report

was submitted into the DOE database under the title “Demolition of Historic and Yet-to-be Determined Radar Towers at Tonopah Test Range (TTR) Without Completing Required NEPA Process”.

In the FY18 D&D Projects spreadsheet, five indirect-funded, one direct-funded, and four DMSEP projects are listed showing that confirmation of SHPO evaluation and NEPA checklist completion is either not submitted or is in process. There is no funding for these D&D projects currently. The Facilities team is working on advanced actions to prepare projects to move forward when funding arrives, but these projects will not move forward until completed NEPA checklists are verified for each project.

Corrective Action Implementation, Verification, and Validation Plan

Fact	Issue	C#	Cause	Cause Code	CA#	Corrective Action	Long term or short-term action?	Action Owner	Due Date	Required evidence of completion	Required evidence of effectiveness
1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed	The caveat in NEPA NM16-0081 excluding approval for the Contraves Tower 12-00 D&D was not obvious.	1	The "Rationale" section, where caveats or approval exclusions would be included, is on the last page of a 15-page checklist	A5B1C01 Communication LTA, Written Communication Method of Presentation LTA, Format deficiency	1	In the NEPA checklist, clearly call out DOE constraints or special conditions on the first page.	Long	N/A	Completed 10/26/2017	Template update with obvious area for special DOE requirements to be captured.	Review open D&D NEPA documents to validate that special conditions are easy to find and are clear.
					2	Modify NEPA emails to include special DOE requirements call-out in a more recognizable way.	Long	NA	Completed 10/26/2017	Sample of emails sent with special DOE requirements.	Sample of emails sent with special DOE requirements.
1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed and 2. It was not recognized that the NEPA checklist NM16-0090 ,	Email notifications from the NEPA application were not effective in triggering action and the exception for Tower 12-00 was not recognized by responsible departments.	2	An individual project manager may be responsible for multiple NEPA checklists and be receiving multiple NEPA emails			JUSTIFICATION FOR NO ACTION: It is not realistic to reduce the number of projects or NEPA documents a project manager may need to track.					
			The Rationale paragraph included in autogenerated emails from the NEPA application are typically standard verbiage and do not usually do not include caveats or approval exclusions.	A5B2C08 Communication LTA, Written Communication Content LTA, Incomplete/ Situation not Covered	2	See CA#2					

which covered Tower #22-00 was not complete before D&D was completed			It is extremely uncommon to encounter a completed checklist with an exclusionary caveat			JUSTIFICATION FOR NO ACTION: This is a desired condition, there should be very few circumstances where special exclusions in a NEPA checklist are present.					
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Fact	Issue	C#	Cause	Cause Code	CA#	Corrective Action	Long term or short-term action?	Action Owner	Due Date	Required evidence of completion	Required evidence of effectiveness
<p>1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed and</p> <p>2. It was not recognized that the NEPA checklist NM16-0090, which covered Tower #22-00 was not complete before D&D was completed</p>	D&D project processes do not include critical steps necessary to thoroughly review NEPA status or special exclusions		Multiple non-value-added forms are required by DOE/NNSA/HUD			JUSTIFICATION FOR NO ACTION: HUD forms required by DOE NA program are outside of the control of SNL.					
		3	Forms filled out by D&D program manager are viewed through the lens of real estate and financial compliance, not ES&H	A3B3C01 Human Performance LTA, Knowledge based Error, Attention was Given to Wrong Issues	3	Conduct program and project reviews before moving to the procurement process to ensure both real estate and ES&H required approvals are in place and that forms are accurately completed.	Long	Jennifer Reisz Westlund	6/29/2018	Review monthly meeting notes for next two to three D&D meetings.	Review the project spreadsheet for the monthly D&D project meetings to validate that the positive verification for D&D projects is occurring regularly.
		4	Procurement process assumes that all previous steps (including NEPA checklist completion) are accurate	A2B5C04 Equipment/Material Problem, Procurement Control LTA, Product Acceptance Requirements LTA	4	Update of the Acquire Construction Supplier Process document (PCS130) for D&D project managers to include positive verification of regulatory requirements including NEPA checklist completion and inclusion of exclusionary caveats.	Long	Matthew Cattaneo	7/31/2018	Updated Acquire Construction Supplier Process document (PCS130).	Review contracts issues between the time of the procurement procedure update and the date of the assessment for D&D projects or validate if there is a positive verification of regulatory requirements documented.

			Normal process for project scoping is segregation by geographical location or funding		JUSTIFICATION FOR NO ACTION: This is a desired condition. Reducing the number of projects is desired to reduce complexity and there are cost accounting standards that require funding from direct sources not be mixed with indirect sources.						
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<p>1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed and</p> <p>2. It was not recognized that the NEPA checklist NM16-0090, which covered Tower #22-00 was not complete before D&D was completed</p>	D&D project processes do not include critical steps necessary to thoroughly review NEPA status or special exclusions	5	Segregation of facilities projects for special circumstances such as "historical" vs. "non-historical" is not normal practice as there are few projects for which this segregation would be applicable.	A4B3C08 Management Problem Work Organization & Planning LTA, Job Scoping did not Identify Special Circumstances and/or Conditions	5	Add a requirement to the D&D Process to create a separate project charter and NEPA checklist if structures in the scope of the project are known to be "historic".	Long	Nicholas Durand	6/29/2018		
					6	If a potentially historically eligible structure is identified at any point in the lifecycle of a D&D project after the charter is created, add a required hold point for NEPA checklist completion before the project can move into procurement process.	Long	Max Saad	8/31/2018	Updated program plan document which calls out hold point requirement if a structure is identified as potential historically eligible.	Review the known existing D&D projects to validate that hold points are followed if a historically eligible structure is identified after the project charter has been created.
					7	Update the existing D&D project spreadsheet and verify that all information is current and accurate.	Short	Nick Durand	43251	Updated D&D project spreadsheet.	Review the project spreadsheet for the monthly D&D project meetings to validate that the positive verification for D&D projects is occurring regularly.
					8	Add a section to the project charter template to identify and address historic structures.	Long	William Tierney	43343	Updated project charter template, with CIAC approval.	Review a sample of at least 10 open project charters (at the time of validation assessment) to validate that known historically eligible structures (as compared to the most recent list) have specific instructions for historic structures.

			Project charter does not include NEPA checklist completion verification.			JUSTIFICATION FOR NO ACTION: The NEPA is not created at the time that the charter is created, this happens later in the process. Verification of NEPA checklist completion will occur upon UCP completion and project authorization.					
		6	Contributing- UCP does not include NEPA information because it is meant for sub-contractor who is not responsible for NEPA compliance.	A5B1C03 Communications LTA, Written Communications Methods of Presentation LTA, Checklist LTA	4	See CA #4					
					3	See CA #3					
					9	Insert a special provisions section to the Universal Construction Package (UCP) to include NEPA checklist information.	Long	William Tierney	Completed 1/3/2018	Updated UCP template with new NEPA section	Review the open D&D projects (at the time of validation assessment) to validate the NEPA section captures the number and checklist complete date in the UCP.

Fact	Issue	C#	Cause	Cause Code	CA#	Corrective Action	Long term or short-term action?	Action Owner	Due Date	Required evidence of completion	Required evidence of effectiveness
1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed	The Project Manager does not have an effective means to be informed of NEPA status challenges or exemptions.		Project managers from facilities were disinvented from monthly meeting between SFO (checklist completion authority) and the NEPA team due to Concerns regarding need to know for projects not owned by facilities.			JUSTIFICATION FOR NO ACTION: This was done at the request of SFO and outside of the control of SNL.					
and		7	Project authorization includes area to list NEPA numbers but does not prompt verification of checklist completion	A5B1C03 Communications LTA, Written Communications Methods of Presentation LTA, Checklist LTA	10	Add a box under the NEPA section of the project authorization that says "NEPA checklist complete" with a "Yes" or "No" check box	Long	Matthew Cattaneo	7/31/2018	Updated project authorization with SHPO consultation addition.	Review the known existing D&D projects to validate that the NEPA checklists were all complete before the authorization was signed.
2. It was not recognized that the NEPA checklist NM16-0090, which covered Tower #22-00 was not				Single SFO point of contact reviews all NEPAs and has many other responsibilities			JUSTIFICATION FOR NO ACTION: This is under the purview of SFO and outside of the control of SNL.				

complete before D&D was completed	8	An alternate forum to the monthly SFO NEPA meeting was not successfully established to provide NEPA status updates to line organizations awaiting NEPA checklist completion.	A5B4C01 Communication LTA, Verbal Communication LTA, Communication Between Work Groups LTA	11	Designate a point of contact in the NEPA group to send facilities' NEPA priority questions to the NEPA team (pre- monthly SFO meeting) and to send updates to (post meeting). Communications to include status updates when SHPO is involved and estimated timeframe for approval.	Long	Stephanie Salinas	5/31/2018	Name of person and initial email chain	Evaluate if the pre and post communications are happening monthly between facilities point of contact and NEPA and if those communications relay status and estimated timeframes.
				12	Provide monthly report of NEPA checklists that have been in review for over 60 days	Long	Stephanie Salinas	4/15/2018	Copy of the monthly report	Measure the change of timeliness in completion of the NEPA checklists before the monthly report was provided and after the monthly report was provided.

Fact	Issue	C#	Cause	Cause Code	CA#	Corrective Action	Long term or short-term action?	Action Owner	Due Date	Required evidence of completion	Required evidence of effectiveness
1. The caveat in NEPA NM16-0081 excluding the tower #12-00 D&D was not recognized before D&D was completed and	Extreme schedule pressure and changing directions contributed to the Project Manager not recognizing the NEPA checklist defects.		Disruption of operational work is not acceptable			JUSTIFICATION FOR NO ACTION: This is a mission critical program and takes precedence over facilities projects					
			Executive pressure to show progress prior to M&O contract transition			JUSTIFICATION FOR NO ACTION: This has been overcome by events as contract transition is complete					

2. It was not recognized that the NEPA checklist NM16-0090, which covered Tower #22-00 was not complete before D&D was completed	9	Multiple projects are expected to be accomplished during small annual window of opportunity at TTR	A4B4C07 Management Problem, Supervisory Methods LTA, Too Many Concurrent Tasks Assigned to Worker	3, 4	See CA #3 and CA#4					
		Divisions had the decisional authority to make decisions regarding space and could change their minds			JUSTIFICATION FOR NO ACTION: This has been overcome by events as contract transition is complete and space management has been moved under facilities decisional authority					

Methods of Causal Analysis

A combination timeline analysis and cause and effect mapping was used to identify the causes of this event. Verbiage captured in the charts differs from the body of the report and the corrective action plan included in pages 1-15. The changes in verbiage were made to more accurately and clearly articulate information pertaining to this event.

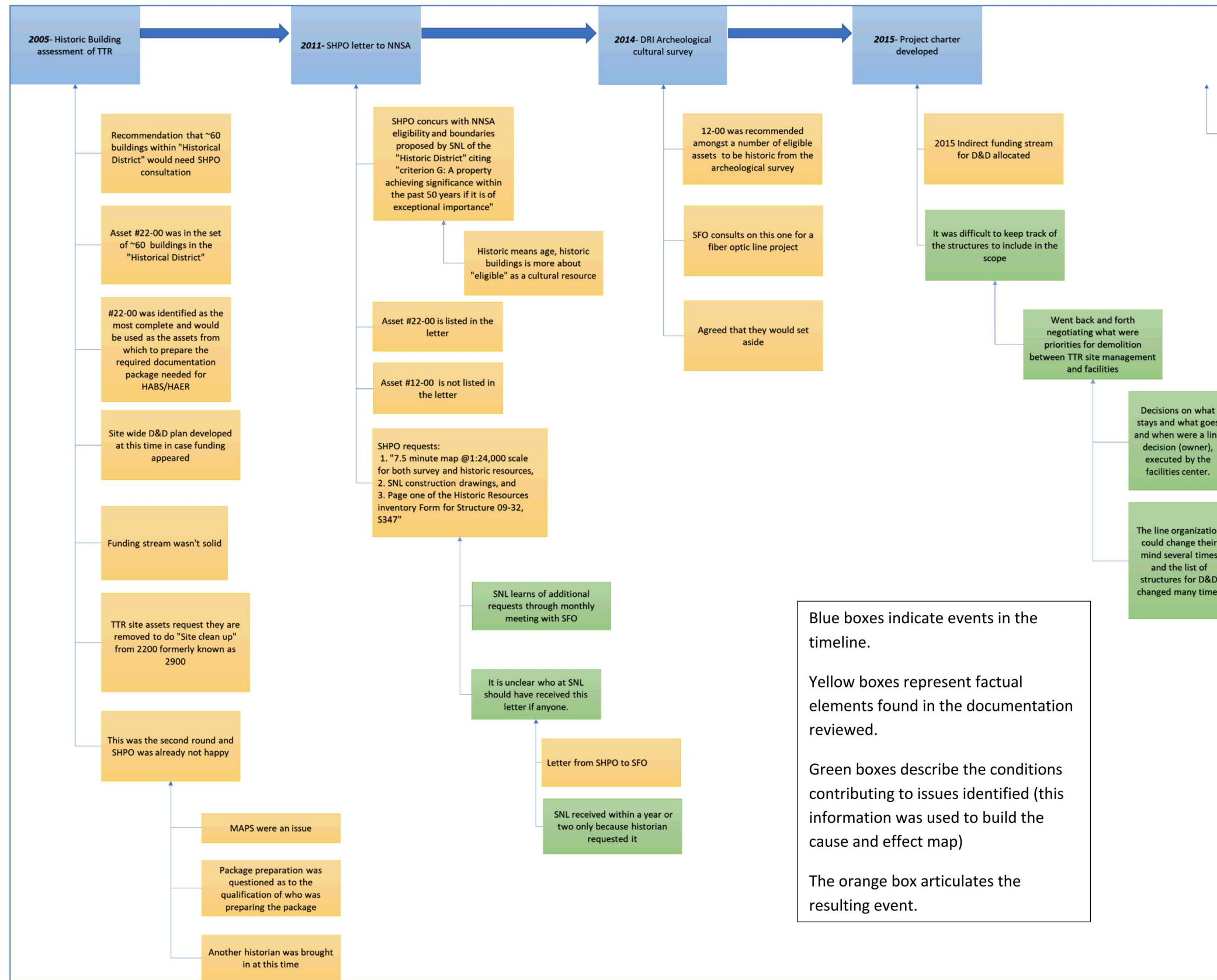
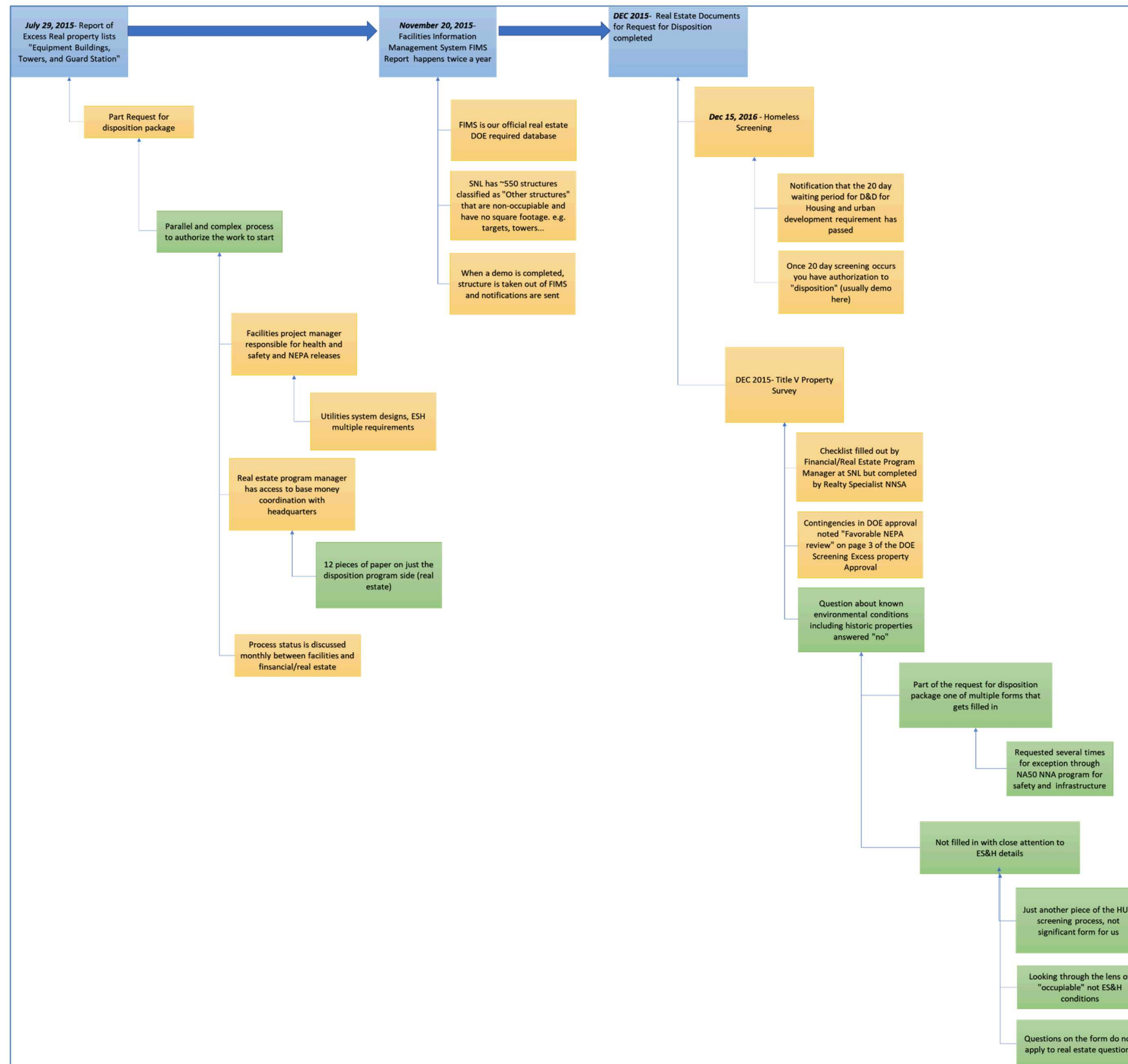


Figure 2- Timeline 2005 – 2015



Blue boxes indicate events in the timeline.

Yellow boxes represent factual elements found in the documentation reviewed.

Green boxes describe the conditions contributing to issues identified (this information was used to build the cause and effect map)

The orange box articulates the resulting event.

Figure 3- Timeline July 2015-December 2015

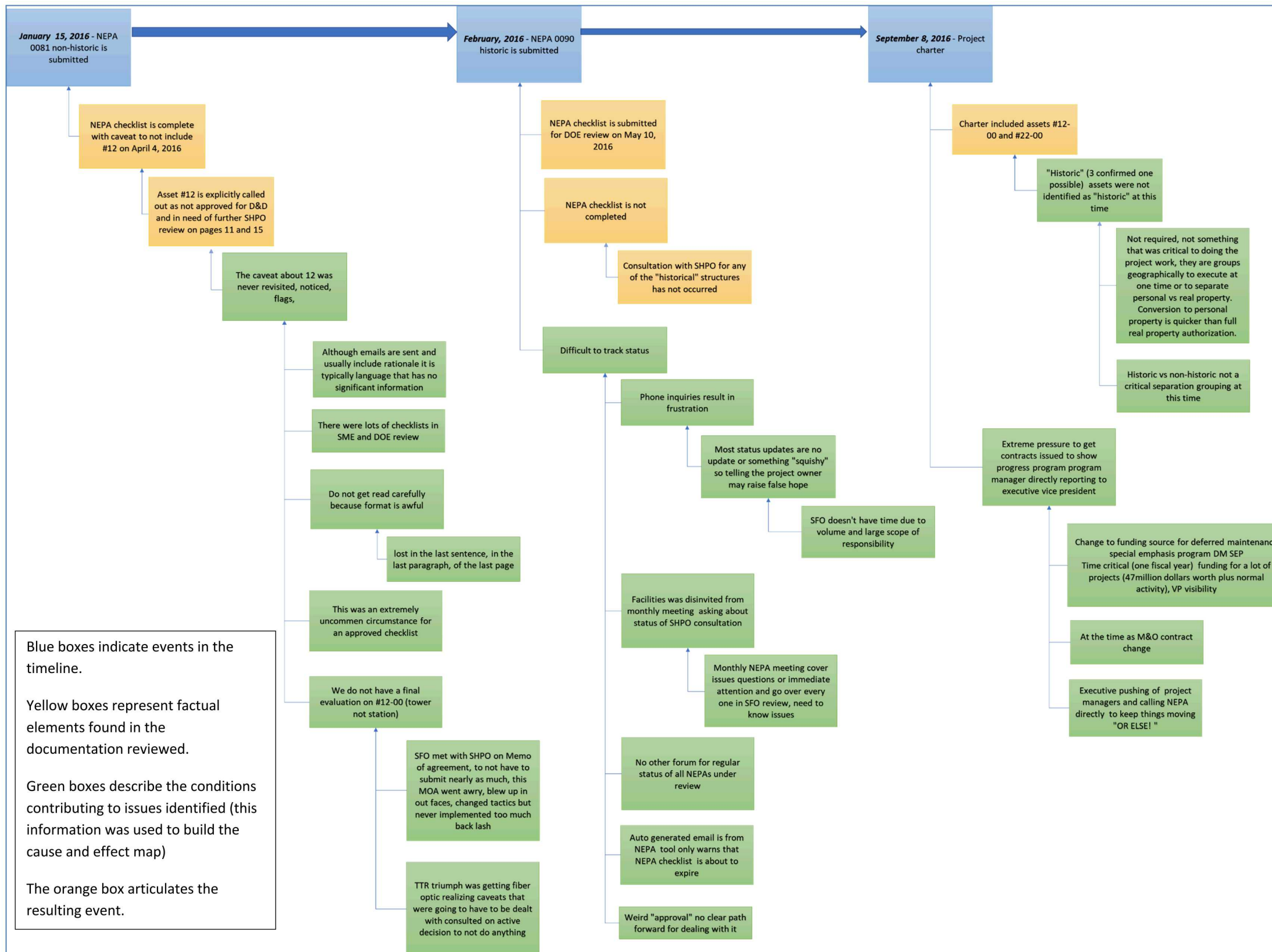
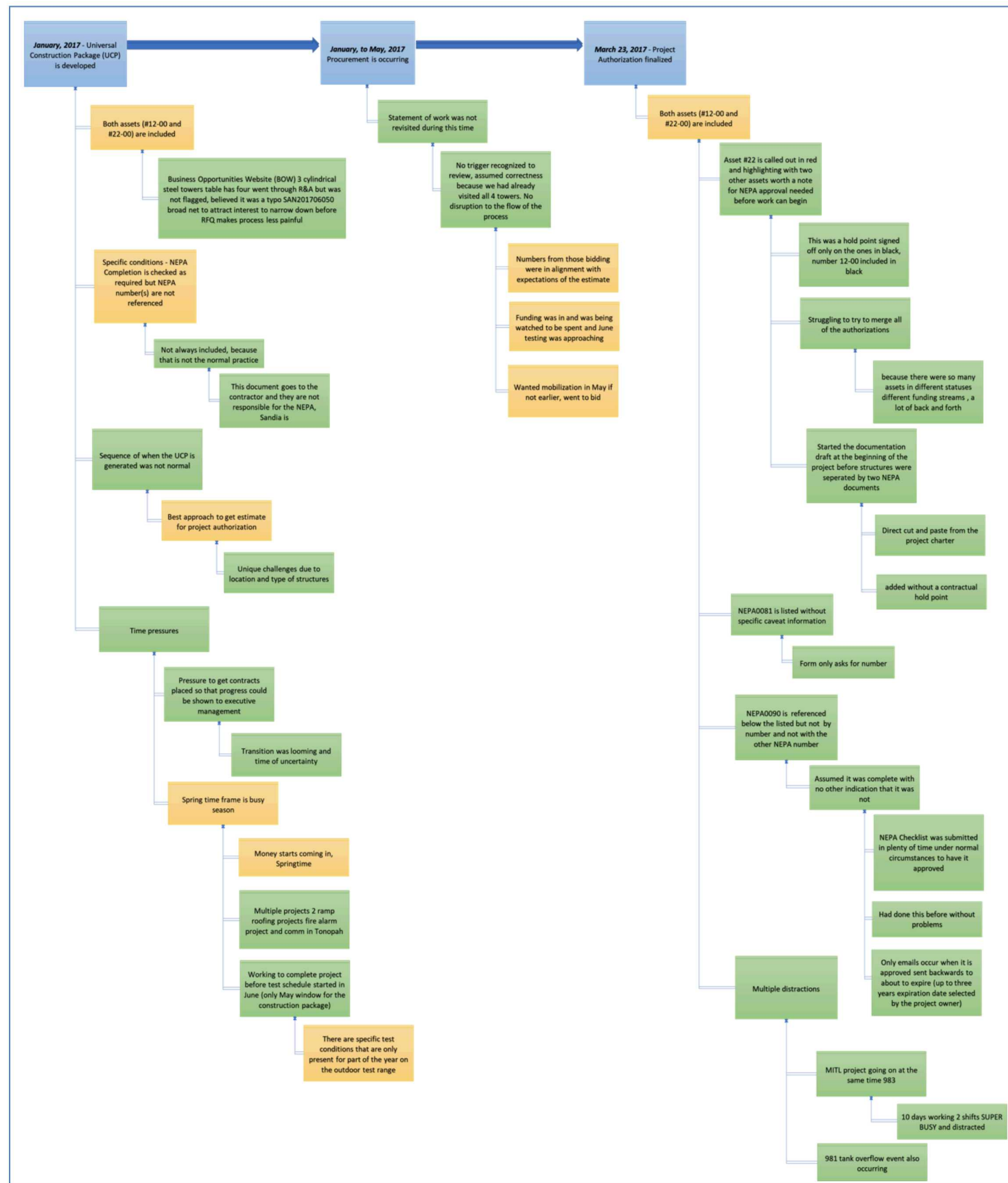


Figure 4- Timeline January 2016-September 2016



Blue boxes indicate events in the timeline.

Yellow boxes represent factual elements found in the documentation reviewed.

Green boxes describe the conditions contributing to issues identified (this information was used to build the cause and effect map)

The orange box articulates the resulting event.

Figure 5- Timeline January 2017-March 2017

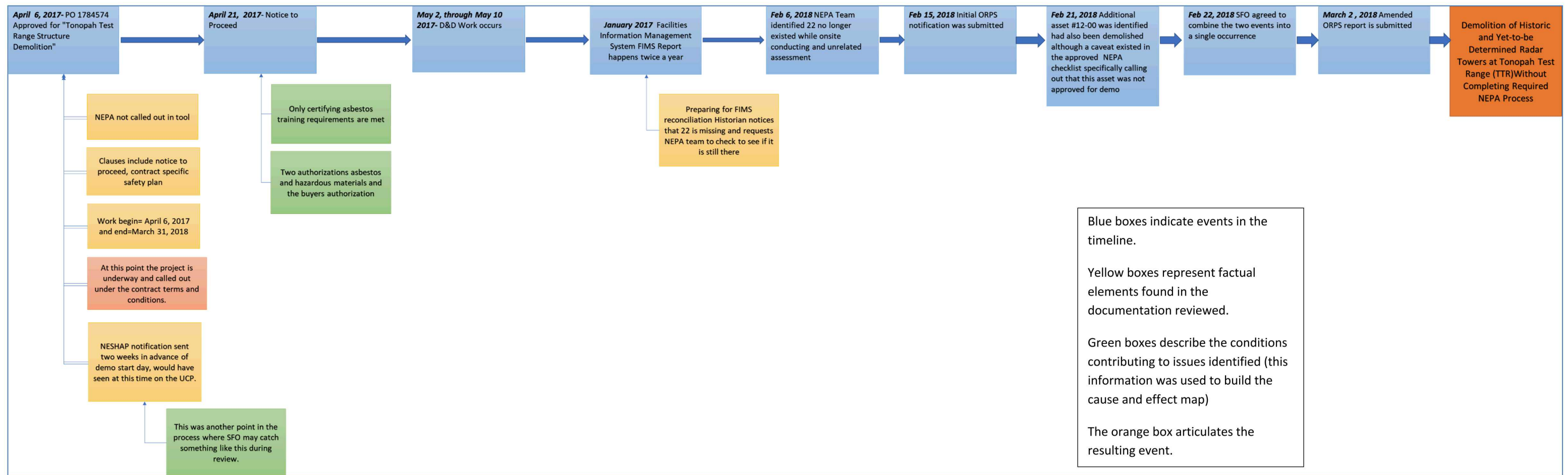


Figure 6- Timeline April 2017-March 2018

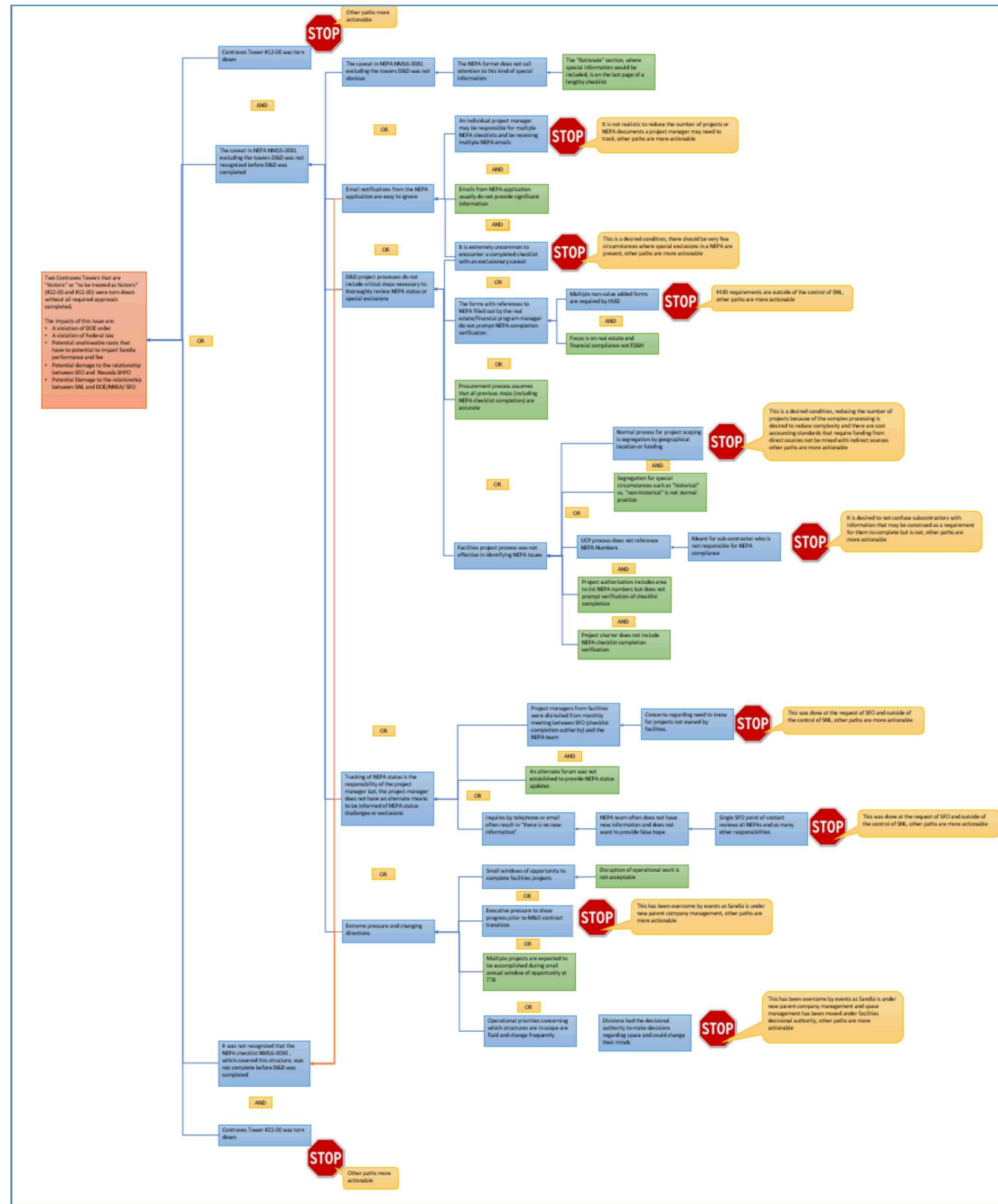


Figure 7- Entire Cause and Effect Map

Note: This figure is provided to give a complete view of the cause and effect map. Figures 8 and 9 are included to provide readable breakouts of this same information.

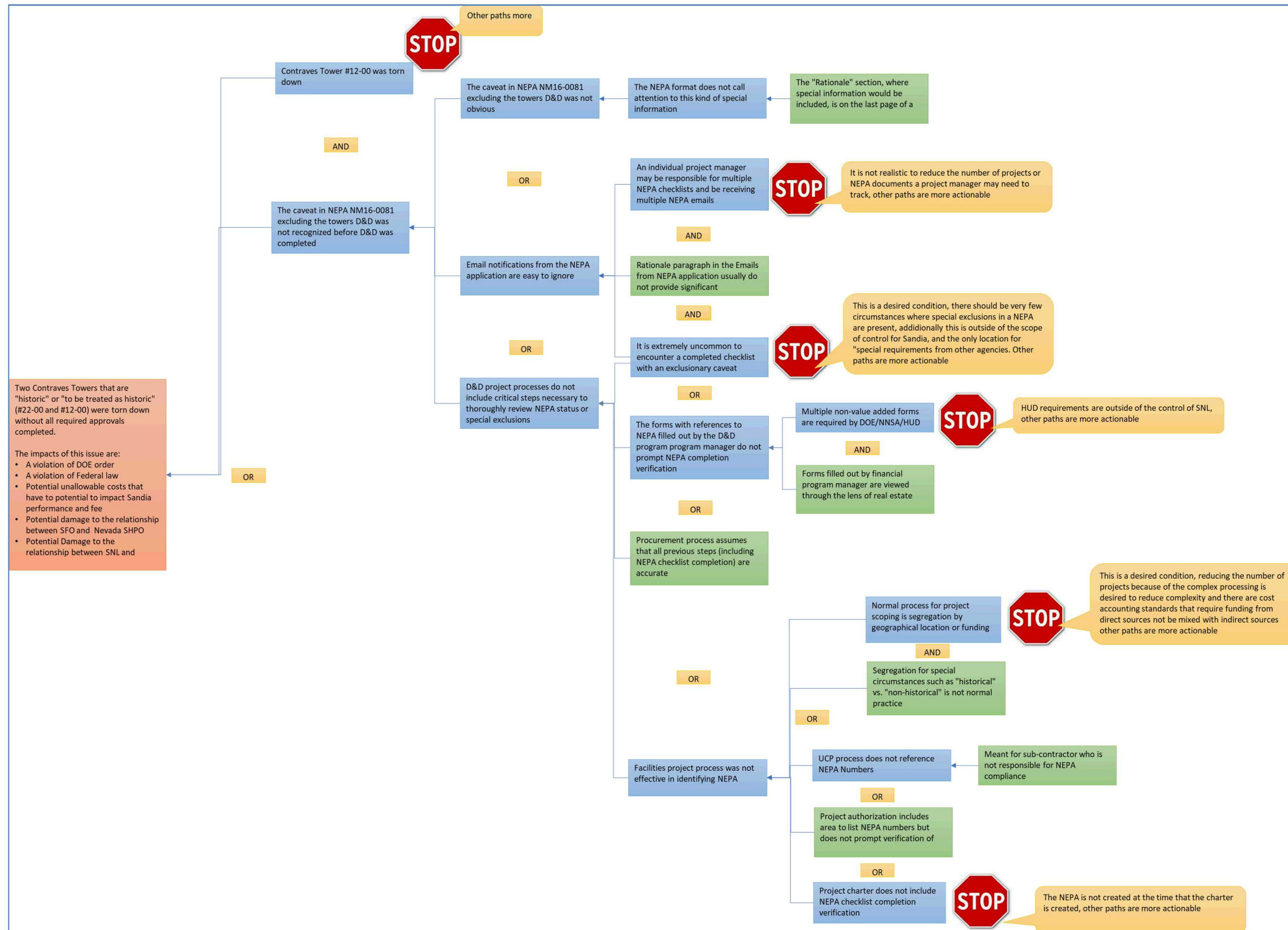


Figure 8- Cause and Effect Map (Top)

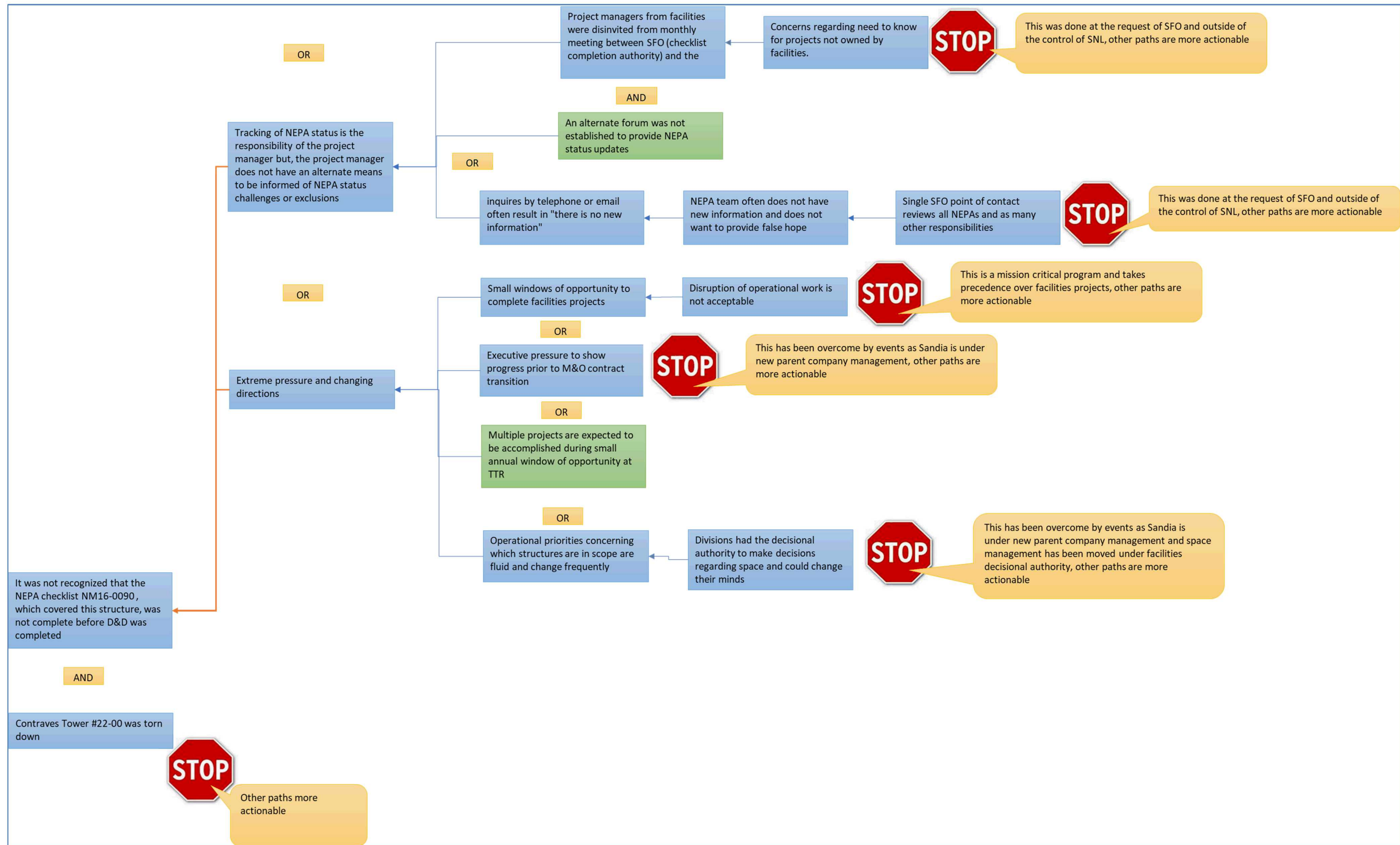


Figure 9- Cause and Effect Map (Bottom)

Causal Analysis Team

Responsible Manager	Mathew Cattaneo	04725
Project Manager	Nicholas Durand	04725
Project Manager	Max Saad	04725
D&D Program Manager	Jill Reisz Westlund	04856
Construction Management	Carlos Montano	04722
NEPA Compliance SME	Jessica Small	00643
Environmental Management Manager	Stephanie Salinas	00643
Facilities ES&H Coordinator	Margie Marley	00633
Assisting Causal Analyst and ES&H Assurance	Stephen Coffing	00635
Corporate Historian	Rebeca Ullrich	10758
Infrastructure and Operations Procurement	Sam Nuzzo	10243
Prime Contract Strategic Specialist	Timothy Madden	11011
Division 4000 Embedded Quality Partner	Raymond Serna	09113
Corporate Senior Causal Analyst	Emily Wright	09211
Assisting Causal Analyst	Charlene MacBain	09211

Observers

SSRSP	Tanja Fitzgerald
SFO	Veronica Martinez
SFO	Constance Martin
SFO	Joyce Arviso-Benally



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