Curriculum Vitae

Daniel J. Turner, P.E.

Principal and Director
IMPACT Engineering and Investigation

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Areas of Specialization

- Failed and Distressed Structures
  - Emergency shoring
  - Causation analysis
  - Repair / replace
  - Building envelope
  - Overload / accidental forces
- Civil Engineering:
  - Structural design
  - Flooding / drainage
  - Foundations
- Ship / Barge Structures
  - Stiffened plate
  - HS steel, aluminum, & composites
  - Direct analysis
- Lifting Appliances (Cranes)
  - Structural integrity
  - Davit cranes
  - Critical lift plans
- Construction / Component Defects and Safety
  - Failure analysis
  - Standard-of-care
  - Code compliance
- Energy and Subsea:
  - Tubular structures
  - SURF (flexibles and flowlines)

Mr. Turner has performed engineering design and analysis for eighteen years in Civil Engineering, Shipbuilding, and Energy. Mr. Turner has a Master of Civil Engineering degree and is licensed in multiple states as a Professional Engineer and Naval Architect. He specializes in structural analysis using advanced analytical methods. As a leader and project manager, he has worked with clients and team members to produce excellent engineering products and present those results on behalf of his clients including in dispute resolution settings.

He has analyzed a variety of materials and structures using techniques that range from basic hand calculations to linear and non-linear finite element analysis and bespoke fatigue analysis. With regard to Civil Engineering, residential and commercial projects are typically worked under the applicable building code, including the ICC International Building Code, and the requirements of the code official. Mr. Turner's Shipbuilding projects have included design and analysis to U.S. Coast Guard and U.S. Navy regulations, as well as various Classification Societies (e.g. ABS and DNV) and foreign flag state requirements. In the Energy sector, projects have been based on the API, DNV, and other offshore standards and guidelines. Principal codes such as AISC, ASTM, ACI, AWS, ASME, and ASCE have been utilized extensively for design and analysis as well as the technical basis for findings in many other cases.

Project sizes have ranged from large-loss property claims to inspection and retrofit design of a door header. The subjects of the work are diverse properties such as subsea oil and gas infrastructure, downstream petrochemical refineries, power generation facilities, various onshore and offshore structures, as well as commercial and residential buildings. Mr. Turner has provided root cause analyses of failures, structural designs and modifications, damage assessments, and litigation support to clients who include insurers, attorneys, independent loss adjusters, general contractors, and owner / operators.

Education

Master of Civil Engineering, University of Houston, 2011
B.S., Civil Engineering, Gonzaga University, 2007
Ocean Engineering, U.S. Naval Academy

Licensed Professional Engineer (P.E.)

Active

Discipline	License No.:
Professional Engineer[1], State of Idaho	P-22277
Naval Architecture and Marine Engineering, State of Washington	23020426
Professional Engineer[1], State of Montana	88364PE
Naval Architecture and Marine Engineering / Structural[2] / Civil, State of Texas	111748

Inactive

Discipline	License No.:
Naval Architecture and Marine Engineering, State of Louisiana	43234
Naval Architecture and Marine Engineering, State of New York	104981
Naval Architecture and Marine Engineering, State of Maryland	55346
Naval Architecture and Marine Engineering / Structural[2] / Civil, State of Oklahoma	32373
Naval Architecture and Marine Engineering / Structural[2] / Civil, Puerto Rico	28232

[1] Does not license engineers by discipline
[2] Not the 16-hour S.E. license

Professional Affiliations

Society of Naval Architects and Marine Engineers (SNAME)
Member
American Society of Civil Engineers (ASCE)
Member

Positions Held

IMPACT Engineering and Investigation, Coeur d'Alene, Idaho
Principal and Director, 2023 – Present
Engineering Systems Inc., Houston, Texas
Senior Consultant, 2017 – 2022
BPP-TECH, Houston, Texas
Engineering Manager, 2011 – 2016
American Bureau of Shipping (ABS), Houston, Texas
Marine Structures Engineer, 2007 – 2011
City of Spokane Valley, Spokane, WA
Traffic Department Intern, 2006 – 2007

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Continued Education (Partial List)

Fundamentals of Earthquake Engineering, American institute of Steel Construction Night School, 2021

Avoiding Ethical Pitfalls in Failure Investigations, American Society of Civil Engineers – Continuing Education, 2021

Diagnosis, Repair, and Restoration of Building Facades, American Society of Civil Engineers – Continuing Education, 2023

Case Study: A Fresh Look at the Citicorp Engineering Ethics Dilemma, American Society of Civil Engineers – Continuing Education, 2023

Evaluation of Building Structural Stability - A Qualitative Approach, American Society of Civil Engineers – Continuing Education, 2023

Introduction to 2015 International Existing Building Code, American Society of Civil Engineers – Continuing Education, 2023

Engineering Judgment: Low-Rise Building Design and Detailing, American Society of Civil Engineers – Continuing Education, 2023

Avoiding Problems in Specifying Metal Roofing, American Society of Civil Engineers – Continuing Education, 2023

Tornado and High Wind Shelter Design, American Society of Civil Engineers – Continuing Education, 2023

Connection Solutions for Wood Framed Structures, American Society of Civil Engineers – Continuing Education, 2023

Safety Training

OSHA 30-Hour, OSHA Powered Industrial Truck (Forklift) Operator Certification, Aerial Lift Operator Certification, and Fall Protection Authorized Person (Basic)

Houston Area Safety Council (HASP) certifications: ARSC Reciprocal Basic Orientation Plus safety training (expired), social security number verification, and Houston area site specific training

North American Substance Abuse Program (NASAP) and North American Background Screening Consortium (NABSC) compliant (Active as of 4/25/24)

BOSIET (Basic Offshore Safety Induction and Emergency Training), Timron Scientific Consulting, Inc., 2016

Company Internal Training: Personal Protective Equipment, Confined Space, Construction Safety and Trenching, Bloodborne Pathogens, Chemical Safety & Management, Respiratory Protection, Asbestos / Lead Awareness, Decontamination Procedures, Machine Guarding, Lock Out Tag Out, Safe Use of Tools, Use of Site-Specific Safety Plans, and Electrical Safety Hazard Awareness (Lock Out Tag Out)

Publications/Presentations

Turner, Daniel and Dennis Scardino. "Emergency Structural Engineering Support of a Fire Origin and Cause Analysis." Published in the proceedings of and presented at ASCE Forensic Engineering 8th Congress, Austin, TX November 29 – December 2, 2018.

Mesyef, Kevin and Daniel Turner. "Evaluation and Repair of Tornado Damage to a Large Manufacturing Plant." Presented at the ASCE 2018 Geo-Structures Confluence, St. Louis, MO, November 2, 2018.

Turner, Daniel. "ABS Naval Surveyor Training Program." Presented at ABS Consulting Group, Houston, TX, December 2010.

Turner, Daniel et. al. "Optimization of Naval Structures Using Lightweight Materials." 18th International Ship and Offshore Structures Congress, vol. 2, 2012, pp. 209-217.

Select Project Experience

Civil / Structural Engineering Design and Analysis

Three-story, wood framed residence with substantial snow load: a complete structural design and specification (new construction) was provided along with the ancillary duties of being the engineer of record. With a 268 pound per square foot ground snow load, story heights in excess of the International Residential Code, high wind loading, Seismic Design Category C, and other factors, this structure required custom design and detailing for the vertical and lateral force resisting systems.

Fire damaged custom home restoration: a residence with a folded plate roof and many unique structural elements was damaged by a fire and required engineering assessment and design including code required structural upgrades. A significant effort was undertaken to retain the unique features of the structure while also specifying code compliant and structurally sound details. A site drainage plan which considered 2-yr and 100-yr storms was also provided and included roof drainage to existing roof drains (e.g. maximum pipe flow analysis) and a comprehensive surface drainage and foundation drainage plans (e.g. specifying areas of sheet flow and detailing foundation drains).

Wind loading retrofit of a power generation facility: several large frames (open-air buildings) were assessed and determined to be at an increased risk from wind loading. A comprehensive inspection and retrofit design was completed and offered to the owner / operator.

Commercial logistics facility roof loss: a large high-bay facility used as a logistics hub lost a portion of the roof due to high winds. The loss was quickly assessed and recommendations for an immediate repair were given. Support was also given regarding permitting and the completion of the work.

Miscellaneous structural inspections and limited repairs / retrofits: for numerous residential and light-commercial projects over six years, specific structural elements such as door headers, floor / roof joists, foundation elements (including manufactured home tie-downs), mass-masonry

walls, garage door portal frames (IRC), bar joists, tapered-web steel portal frames, and other structural and non-structural elements have been inspected in various conditions. Condition assessments, repair / replace drawings, and other forms of engineering opinions have been provided to meet the requirements of the project.

Slab foundation and steel canopy structures at an industrial facility: two structures were designed and specified to hold substantial industrial equipment. Due to site conditions, the depth of the footings was very limited and required specialized design and analysis.

Neighborhood flooding: several homes in a small subdivision suffered flooding after a storm. The streets, curbs and gutters, and top-of-slabs were measured with a laser scanner (the storm water pipe inverts were also measured) and opinions regarding the susceptibility to flooding were given.

Crawler crane failure: a 275-ton crane suffered a failure of the boom-to-jib connection which resulted in the jib falling creating a significant hazard to life and safety. An investigation into the crane control systems and the failed components was undertaken.

Tornado damage of a large commercial production facility: several buildings were in varying degrees of distress including one that had to be demolished and other building that was partially demolished with a few columns and plate girders recovered. In support of resuming operations as soon as possible, an advanced analysis and remediate plan was undertaken to bring the tapered plate girders into compliance without removal.

Sinkhole investigation: a large sinkhole developed in the right-of-way blocking access to a property. The soil was observed washing into a buried stormwater drain and it was suspected that a horizontal directional drilling operation was a possible cause and/or contributor. A subsequent investigation and analysis was undertaken.

Galvanic (dissimilar metal) corrosion of a water treatment tank: an above ground carbon steel water tank was taken out-of-service prematurely due to advanced corrosion. An investigation was immediately executed, prior to an impending demolition, to document the coatings and the connection to the stainless-steel baffles.

Roof collapse due to ponding: a commercial flat roof, which had only a primary roof drain and a very large well area, failed during a rainstorm causing the loss of the roof and several tilt-up walls. The code requirements were researched, the maximum load calculated (i.e., the geometry of the ponding was analyzed based on the hydraulics of flowing out of the drain), and the capacity of the open web bar joists was calculated.

Technical Damage Assessments

Residential and light commercial facilities: over a period of six years, many wood light-framed homes, concrete tilt-up commercial facilities, steel frames, and steel buildings have been assessed regarding damage from wind, flooding, leaks, impacts, fire, and explosions. Typically, this work involves a site inspection, research, analysis, and then the development of repair / replace plans.

Hurricane damage to prison facilities: in an extended program lasting several months, hundreds of buildings (cell blocks, administrative buildings, multi-story hospitals, mechanical, electrical power transmission, and other facilities) were inspected and documented for possible hurricane damage. The work included scheduling access with the Department of Corrections and Rehabilitation. Mr. Turner was the Inspection Lead, coordinating the logistics and performing the quality control, for about 10 inspectors.

Post explosion assessment for recovery: a steel framed, mixed-use facility sustained a significant explosion and was ordered demolished by the property owner. A structural assessment was undertaken and the scope of a complete demolition and replacement was compared to a more selective repair.

Sewage outfall pipe instability: a substantial HDPE pipe was “floated-out” (towed into position) and installed on the seabed. Prior to completion of the installation, the pipe’s on-bottom stability was compromised requiring substantial mitigation. A root cause investigation was undertaken and support regarding the cost of mitigation was also provided.

Water ingress to a hotel reportedly caused by hail damage: immediately after significant flooding was reported to the insurer, an inspection of the roofing, drainage, and cladding was undertaken. The hail event had been more than a year prior and an opinion on the relationship to the water ingress event was given.

Post-hurricane damage assessment of gas stations and fuel storage facilities: ten sites across three Caribbean islands (spread out over a 100+ mile distances) were inspected and assessed for structural and water damage.

Major explosion of a petrochemical plant: on behalf of the insurers, a damage assessment was performed on an 8-acre site with significant explosion and fire damage. Steel and concrete buildings were assessed for residual value and their potential for recovery.

Advanced Analysis – Ocean Engineering, Energy, and Onshore / Offshore Structures

Retaining wall design: after significant flood, a suspected rapid drawdown condition had eroded the banks of a bayou near to, and potentially endangering, a refinery's critical storage and process equipment. A detailed design of a cantilever sheet pile wall was designed and specified.

Corroded FPSO mooring chain FEA: in support of a risk mitigation and service life assessment, a detailed FEA (finite element analysis) was performed based on 3-D scans of in-service links. The breaking strength and stress concentration factors (SCFs) were provided to the client for further assessment.

Fatigue analysis of SPM buoy umbilical: a complete and concise umbilical fatigue life assessment was reported to the client. The motions on the umbilical were rigidly imposed by other structures which required a time domain analysis of the system.

FEED of an extreme sour service ESP (electrical submersible pump) cable: the client supplied environmental conditions that exceeded the sour service limits of ISO 15156 and requested that a suitable mechanical design and material specification be investigated. Several design variants were proposed including stainless steel, Inconel, Hastelloy, and titanium armor wire and the feasibility of the cable was discussed.

FEED of a deep-water cable: a "turn-key" cable mechanical design including the cable's structural stiffness, response to dynamic global loads, internal stress, and other limit states was developed and design drawings and specification provided to the client.

Floating concrete dock assessment: a dispute as to whether the witnessed damage was wind or wave driven had important financial considerations in the case and the loss adjuster client requested an engineering report. Photographs and historical meteorological data were reviewed, and a clear, well-founded determination was made.

Dispute Resolution

Steel jacket (ocean) structure failure during installation: a complex structure failed during installation and an investigation and dispute followed. Extensive technical meetings on behalf of the underwriters were attended and reported on. Specifically, an opinion on the efficacy of the design regarding the API RP 2A was required including drafting a technical response to another party's root cause analysis. An independent non-linear FEA (finite element analysis) was completed to support all opinions offered.

TLP mooring installation failure: the attorney clients had to be advised on the technical aspects of a RCA (root cause analysis) which required independent verification calculations. The client also requested technical support in meetings with other technical experts.

Forensic analysis of a crane commissioning failure: a non-linear FEA (finite element analysis) was completed as part of the resolution of the insurance claim dispute. The analytical methods for

the event reconstruction were code based (AISC 360: Specification for Structural Steel Buildings) and included physical evidence and witness statements.

Shipyard Tax Court case: a matter before the US Tax Court required substantial technical assistance regarding many different kinds of barges, lifting appliances, other vessels, and shipyard operations. Details on the applicability of ABS, other design standards, and best practices were given.

Possibly hazardous chemical release and fire: assisted lead council in the development of SME (subject matter expert) responses and strategies. Technical work and research to API 570, 574, and 581, ASME B31.3, and OSHA 1910.119—PSM (Process Safety Management) of highly hazardous chemicals. Provided consultant expert services for the SME deposition process.

Fiber Reinforced Plastic (FRP) barge loss investigation: the barges were used to support pumps and associated piping in a mine leachate detention pond. The fluid in the detention pond, essentially sulfuric acid, reportedly reacted with the internal components of a barge causing a loss in stability and, eventually, the loss of the equipment. An investigation into quality, handling, and other details was undertaken.

Risk Analysis

FPSO mooring risk assessment: a fitness for purpose assessment was provided using internationally published guidelines and proprietary knowledge.

Offshore pipelay installation risk assessment: the program documentation was reviewed as a third-party verification check in support of the Marine Warranty Surveyor's (MWS) "go" or "no-go" decision.

Advanced Analysis – Ship Engineering and Composites

DDG 1000 Zumwalt-Class Destroyer (US Navy) composite deckhouse review: in a project that spanned over two years, Mr. Turner led the team that reviewed the composite deckhouse to the ABS Rules. The work included independent structural analysis (FEA and first principals) to structural limit states (strength, deflection, buckling, and vibration). The work also included reviewing the material characterization program for the carbon fiber, sandwich panel composite structural system. Reviewing the quality control and assurance program was a critical element of the work.

DDG 1000 Zumwalt-Class Destroyer (US Navy) high-strength steel hull review: concurrent to the composite deckhouse review, a plan review which included analysis of the steel hull to the structural limit states was undertaken and included weld design (HSLA-80 and other high tensile steels).

Critical lift plans and barge stability analysis: in support of well plug and abandon operations at shallow water worksites, workplans were developed with the project stakeholders and inspection,

desktop review and analysis, and other coordination of efforts resulted in a letter and critical lift plan that was sealed by Mr. Turner. The work was completed safely.

Deck barge modification for crane operations: the risk of a structural failure of the barge was identified through other work and subsequently verified by an inspection by Mr. Turner (which included a safely executed confined space entry). Repair and retrofit drawings were promptly provided to the operator and an inspection for recommissioning was coordinated.

Achieving Service Life Program (US Navy): an integrated structural analysis tool for the assessment of the ultimate strength and buckling limits of stiffened plate structures was developed for use by other engineers in the department. The goal of the program was service life extension through advanced analysis of existing (corroded) structures. Lateral torsional buckling (tripping) was considered.

Large commercial yachts and US Army Corps of Engineers steel barge review and modification: Several projects over four and a half years required review and assessment as well as modification. Various hull material types including composite, aluminum, and steel materials defined, in part, the ABS Rule requirements and the analytical methods required check for compliance to the rules. Specifically, the work included FEA (finite element analysis) of crane foundations, engine foundations, and other structures. Other statutory requirements included: USCG, Load Line Convention, SOLAS, and international flag state codes.

Rule development: working with novel designs and trouble-shooting client inquiries led to considerable work in rule development. Issues in technical accuracy and consistency were addressed as well as the incorporation of advanced composite material characterization to existing rules.

Fire and Explosion Investigation and Emergency Response

Post explosion evidence recovery and emergency shoring: a steel framed, mixed-use facility sustained an explosion requiring emergency shoring, structural assessments, and the excavation of a gas and electric “common” trench for evidentiary purposes. The project was widely reported in the media and the evidence recovery work was on an extremely compressed schedule.

Structural support of a fire investigation: a tilt-up concrete, light commercial building suffered a fire and partial roof collapse. An emergency shoring plan and onsite engineering supervision was provided for the subsequent fire investigation of the distressed structure. Flammability and toxicity hazards were mitigated.

Natural gas explosion at a hospital: immediately following the event, Mr. Turner responded to the site, collected information and reported to the utility provider client. Critical evidence was preserved, and the client was well informed of the unfolding situation.

Snow shedding and possibly related gas meter fire: the location of a gas meter was identified as a possible contributor to the fire due to snow sloughing off the roof. An investigation was undertaken including the use of an ad-hoc snow shield.

Damage to a hotel porte cochere: the covered parking area of a hotel lobby entrance was struck by a vehicle and required repair. A repair / replace drawing including the shoring details was developed along with a pedestrian access plan given that the entrance had to be accessible during the repair process.

Construction / Component Defects and Safety

Subsea component failure and a claim of defect: a component of a producing well failed in service and the supplier of the component was accused of providing a defective product. An extensive review of the file materials was undertaken and opinions regarding the loss were given based on a detailed recreation of the timeline of events and an accounting of the key evidence.

Electrocution of a worker: while a worker was traversing a building under construction a reportedly unsecured electrical component caused an electrocution injury. An investigation was carried out and opinions based on the safety records of the possibly responsible parties were given.

Forensic analysis of a pipeline concrete collar loss: after the collars providing negative buoyancy to an intake pipeline were found to have failed, a structural investigation was undertaken. The pipeline loading was complex (time domain numerical analysis) including the inertial effects of the collars.

Claim of insufficient lighting resulting in a trip and fall: a crew member of an offshore platform claimed that the sill of a doorway in a berthing space was not properly illuminated resulting in a tripping hazard. The regulatory standards for the lighting and sill height were reviewed and addressed.

Investigation of shear dowels for concrete balconies: a high-rise condominium building under construction had observed cracking at the shear dowels. An investigation was undertaken that included an FEA (finite element analysis) and detailed code checks.

Weld area failure leading to the loss of structural integrity: a detailed design review (including the STAAD-PRO models) of a square tubular connection was undertaken in support of a causation analysis. Details of the “as-built” connection were reviewed to the requirement of the AISC-360 and the details of the forensic evidence of failure were related to the suspected root causes of the loss.