



DANIEL (DAN) J. TURNER, P.E.
SENIOR CONSULTANT

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Mr. Turner has performed engineering analysis for fourteen years in Energy, Shipbuilding, and Civil Engineering. Mr. Turner has received a Master of Civil Engineering degree and is licensed in multiple states as a Professional Engineer. 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 in dispute resolution settings.

Mr. Turner has analyzed residential and commercial structures from the global perspective (e.g. wind loads to a multi-story building) down to single components (e.g. finite element analysis of dowels supporting balconies) and various levels of analysis in between. These analyses have included a variety of materials and structures using techniques that include linear and non-linear finite element analysis. Principal codes such as AISC, ASTM, ACI, AWS, ASME, and ASCE have been utilized extensively for design as well as the bases for findings in many other cases.

In large-loss and smaller cases involving refinery, petrochemical, onshore / offshore structural, as well as commercial and residential work Civil Engineering, Mr. Turner has provided root cause analyses, damage assessments, and litigation support. Typical clients include insurers, attorneys, loss adjusters, and owner / operators.

Areas of Specialization

Assessment of Failed and Distressed Structures: emergency shoring / recovery, causation, and repair / replace cost assessments due to overload, fatigue, and/or accidental (e.g. explosion) forces

Energy and Subsea Engineering: tubular structures, mooring analysis, flexibles (SURF), and pipelines

Civil Engineering: Windstorm, lateral loads (earthquake and wind), and machinery loads

Ship Structures Analysis: stiffened plate construction, specialized materials, and highspeed craft

Lifting Appliances (Cranes): structural integrity, rigging, davit cranes, and heavy lift operations

Construction Defects and Safety: failure analysis, standard-of-care, and usage of required standards

Education

Master of Civil Engineering, University of Houston, 2011

B.S., Civil Engineering, Gonzaga University, 2007

Ocean Engineering, U.S. Naval Academy

April 2020



Licensed Professional Engineer (P.E.)

Naval Architecture and Marine Engineering, State of Texas	License No. 111748
Naval Architecture and Marine Engineering, State of Louisiana	License No. 43234
Naval Architecture and Marine Engineering, State of Maryland	License No. 55346

Other Endorsements

Texas Department of Insurance (Windstorm Insurance Association) – Qualified Inspector

Professional Affiliations

Society of Naval Architects and Marine Engineers (SNAME)

Member

American Society of Civil Engineers

Member

Propeller Club of Houston

Member

RIMS – Houston Chapter

Member

Houston Claims Association

Associate Member

Positions Held

Engineering Systems Inc., Houston, Texas

Senior Consultant, 2017 – present

BPP-TECH, Houston, Texas

Engineering Manager, 2011 – 2016

American Bureau of Shipping (ABS), Houston, TX

Marine Structures Engineer, 2007 – 2011

City of Spokane Valley, Spokane, WA

Traffic Department Intern, 2006 – 2007

Continued Education and Safety Training

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

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

ESi 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

Dispute Resolution

Steel jacket structure failure during installation: the structure in question had a complex geometry which led to an involved discussion regarding the initiating event. This difficult issue required representation of the underwriters' interest. 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 also required independent verification calculations. The client also requested representation in meetings with other technical experts.

Forensic analysis of a crane commissioning failure: a non-linear FEA was conducted at the request of the client as part of a pre-litigation proceeding. 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.

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 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.

Technical Damage Assessments

Residential and light commercial facilities: over a period of three 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. In some cases, a quantitative analysis regarding the cost of repair is given.

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 hurricane damage. The work included scheduling access with the Department of Corrections and Rehabilitation.

Technical Damage Assessments (continued)

Post explosion assessment for recovery: a steel framed, mixed use facility suffered a substantial explosion and was ordered demolished by the property owner. A structural assessment was undertaken and cost of a complete demolition and rebuild was compared to a more selective repair.

Sewage pipe outfall instability: a substantial HDPE pipe was floated-out and installed on the seabed. However, prior to completion of the installation, the pipe 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 from reported hail damage: immediately after substantial flooding was reported, 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-fire structural assessment: a high-bay, light commercial building suffered a fire and required an immediate inspection by a structural engineer. The client was advised on the integrity of the building and given council regarding the options for repair / replacement.

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 heavy explosion and fire damage. Steel and concrete buildings were assessed for value and potential for recovery.

Fire and Explosion Investigation and Emergency Response

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

Structural support of a fire investigation: a tilt-up construction, 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, engineers 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 of the roof. An investigation was undertaken including the use of an ad-hoc snow shield.

Fire and Explosion Investigation and Emergency Response (continued)

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.

Advanced Analysis – Civil / Structural Engineering

Tornado damage of a large commercial production facility: several buildings were in varying degrees of distress including one that had to be demolished down to a few columns and plate girders. 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 *in-situ*.

Sinkhole investigation: a substantial 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. A subsequent investigation and analysis were undertaken.

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.

Retaining wall to support refinery foundations: after recent flooding a suspected rapid drawdown condition had eroded the banks of a bayou near potentially endangering critical storage and process equipment. A detailed design of a cantilever sheet pile wall was designed and specified.

Neighborhood flooding: several homes in the Houston area suffered flooding after a major storm event. The streets, 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 was given.

Flooding of a residence: after utility work in an adjacent right-of-way, stormwater was observed flowing on to private property with reported flooding of a residence. A detailed investigation of the site and the City's utilities was undertaken, and a subsequent analysis calculated the amount of possible stormwater and the required drainage facilities.

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.

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 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 developed.

Construction Defects and Safety

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 loading investigated was complex (time domain) including the inertial effects of the collars.

Claim of insufficient lighting resulting in a fall: a crew member of an offshore platform claimed that the sill of a doorway in a berthing space was not properly lit. The regulatory standards for the lighting and sill height were reviewed as well as an analysis of the effectiveness of the lighting.

Investigation of shear dowels for concrete balconies: a high-rise condominium building under construction had observed cracking in-way-of the shear dowels. An investigation was undertaken that included a finite element model 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 and the details of the forensic evidence of failure were related to the suspected root causes of the loss.

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

Corroded FPSO mooring chain FEA: in support of a larger risk mitigation and service life assessment, a detailed FEA 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. To ensure accuracy and maximize the value of the work, the results were calibrated with full scale testing data.

Fatigue analysis of SPM buoy umbilical: a complete and concise umbilical fatigue life assessment was supplied 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 returned. Several design variants were proposed, 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 returned to the client.

Floating concrete dock assessment: a dispute as to whether the witnessed damage was wind or wave driven had serious financial repercussions 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 based on a wave hindcast and propagation analysis.

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 all 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, an effort to analyze the steel hull to all structural limit states was undertaken and included weld design (HSLA-80 and other high tensile steels).

Achieving Service Life Program (US Navy): an integrated structural analysis tool for the assessment of the ultimate strength and buckling limits of plate between stiffeners 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. The hull material types, composite, aluminum, and steel, drove the ABS Rule requirements and required adaptation and a diverse engineering foundation. Specifically, the work included FEA 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 advance composite material characterization to existing rules.