RESPONSE BY MARIA GARZINO

TO: DoDIG Supplemental Report Prepared by Parsons

What follows is my response, to the Department of Defense Inspector General (DoDIG) Supplemental Report prepared by Parsons, entitled 'Independent Engineering Assessment of the New Orleans Temporary Outflow Canal Pump', Contract No. GS-00F-0005R, Parsons project No. 746558, dated February 27, 2009.

This DoDIG Supplemental Report by Parson was ordered to be accomplished by the Secretary of Defense in response to the Office of Special Counsel's (OSC) conclusions that the DoDIG response to my allegations was superficial and dismissive. This response (submitted Supplemental Report) from the Secretary Defense is based in part on concurrence with OSC's findings that government cannot afford to take unnecessary risks with public safety due to faulty pumping equipment and lack of proper government oversight – that every effort must be made to assure the citizens of New Orleans that pumps designed for flood protection will perform as specified during hurricanes. To that end the Secretary of Defense ordered that Parsons determine whether the pumps were, in fact, adequately tested and to evaluate the likelihood that the pumps could be vulnerable to failure in the event of a hurricane.

The resulting Supplementary Report by Parsons was transmitted to me by the OSC on April 02, 2009 for my review and response. A review of the intended general content of Parsons Supplementary Report (PSR) yielded it addressed two main assessments – Testing Adequacy Analysis and Vulnerability Analysis. Their Testing Adequacy analysis was broken down into three main areas; Factory Testing, Field Testing, and Laboratory Physical Sump Pump Model Testing. Their Vulnerability analysis was broken down into five main areas with an addendum addressing two hurricane events; Operational Vulnerabilities, Maintenance Vulnerabilities, Pump Capacity Analysis, Pump and Support System Analysis, and Performance During Hurricanes Gustav and Ike.

My response to the PSR will be organized in Sections as follows:

1. Summary Response: My overall summary response to the finding as presented in the Parson's Supplemental Report (PSR).

2. Point-By-Point Response to the PSR: A point-by-point response to the issues/ideas following as they are presented in the PSR.

3. Additional/Supplemental Rebuttal to the PSR: A detailed and documented supplementary rebuttal to the more prominent improper conclusions/findings as presented in the PSR, including presenting and citing attachments that demonstrate clear independent evidence the misrepresentations, false demonstrations, and blatant errors that constitute the basis of the findings as presented by the PSR. This rebuttal will address the following more prominent issues:

3.1 Lack of Credible/Factual Acceptance Testing. Acceptance testing was not accomplished as reported forward by USACE, as reported in the DoDIG Report, and as subsequently reported in the subject PSR.

3.2 Hydraulic Pumping Equipment Failure Issues. Hydraulic pumping equipment failure issues have not been resolved – serious and potentially catastrophic vulnerability issues remain unaddressed. The following unresolved failure/potentially catastrophic vulnerability issues will be addressed:

3.2.1 Lack of Credible/Factual Acceptance testing – unable to credibly ascertain the mechanical integrity of the existing hydraulic pumping equipment.
3.2.2 Significant O-Ring/Seal failure issues – at the factory and subsequently extensively in the field, and, likely attributable to hydraulic system design deficiencies.
3.2.3 Hydraulic system design deficiencies/defects – including significantly undersized Durst pump drives and hydraulic oil reservoirs.
3.2.4 Significant Gear Oil Circulation Motor/Durst Drive failure issues – at the factory and subsequently in the field, and, also likely attributable to hydraulic system design deficiencies.
3.2.5 High pressure hydraulic pipe failure issues – piping not built in accordance to industry standards and ASTM code.
3.2.6 Excessive hydraulic system pressures and related hydraulic component failures

3.3. Hydraulic Pump Runs During Hurricanes Gustav and Ike. Hydraulic pump runs during Hurricanes Gustav and Ike were not as reported in the PSR – none of the pump run data reported in the PSR constitutes factual/truthful reporting. Actual hydraulic pumps run data provides and proves a plethora of contradictory conclusions to the PSR – including a prima facia case for official USACE reporting forward that constitutes an organized white wash intended to provide cover as to the true condition of the hydraulic pumping equipment. In addition, the PSR anchors its analysis and findings on the faulty premise the hydraulic pumping equipment was built for a design rainfall storm event of 10-years – the true/factual design storm event for the hydraulic pumping equipment, as reported to Congress and the public, is for a 100-year storm event (e.g. Hurricane Rita).

3.4. Authorized and Intended Lifespan of Pumping Equipment Installed at the Three Closure Structures. The PSR bases its plethora of various analyses on the faulty premise the hydraulic pumping equipment's

useful life is between 5-7 years – they site a plan by USACE to abandon in place the newly built ½ Billion dollar closure structures with installed pumps and build an almost identical project (gated/permanent closure structure with installed pumps), at a cost of $800+M, a stones throw from the abandoned in place project (a few, maybe 100 yards further downstream). Official USACE documentation, including contract documentation, and, congressional actions defining and authorizing the project show clearly the hydraulic pumping equipment in question was authorized and procured with the intent of being able to operate successfully up to customary and usual industry standards for expected performance period of samc , 50-years, not abandoned in place after 5-7 years. In addition, official USACE documentation, recorded statements in conjunction with official presentations made by leading TFH officials, and, congressional actions defining and authorizing the interim closure structures with installed pumps, clearly show the interim closure structures with installed pumps were intended to be **included** in any future follow-on project to increase the level of storm protection – not abandoned in place after 5-7 years. In compliance with the authorized project as presented to Congress, up to and including April 12, 2007, USACE proffered, through documentation and official testimony, the inclusion of the newly built structures into their planning process for any future follow-on projects to increase the level of storm protection – not abandon them in place after 5-7 years.

3.5. Permanent Enhancement of the ICS Facilities Final Report dated April 27,2009. This Report, prepared for USACE, MVD, NOD by ECM-GEC Joint Venture, investigates and reports forward on what modifications are required to extend the life of the Interim Control Structures (ICS) at all three outfall canals to a 50 year design life. Amazingly this report recommends all the currently installed direct drive pumps remain and all the currently installed hydraulic pumps and their associated piping with support structures be removed and replaced with direct drive type pumps and associated structures. This Report goes on to state problematic operational and maintenance issues surrounding the hydraulic pumps are the main reason for recommending they be removed and replaced. This Report goes on further to recommend improving pumping capacity at all three outfall canals by adding direct drive type pumps to the existing ICS in order to meet the pumping capacity associated with a 100 year storm event.

4. Conclusion.

Appendix - Listing of Cited Documents and Attachments: As already provided, and/or to be provided, with the submission of this response.

SECTION 1 – Summary Response

The PSR concludes that my issues as have been brought forward have been resolved, the hydraulic pumps were successfully testing in the field, that there are no immediate vulnerabilities to catastrophic failure with the hydraulic pumping systems or their supporting systems, and that the hydraulic pumps were called into duty during Hurricane's Gustav and Ike in order to keep the city of New Orleans safe and performed successfully.

In true summary fashion, my issues as have been brought forward have **not** been resolved, the hydraulic pumps were **not** successfully testing in the field, there **are** immediate viable vulnerabilities to catastrophic failure with the hydraulic pumping systems and/or their supporting systems, and the hydraulic pumps called into duty during Hurricane's Gustav and Ike, were **not** needed in order to keep the city of New Orleans safe, and did **not** performed successfully. However, I will elaborate a bit more…

<u>The issues I have brought forward have **not** been resolved.</u>

Numerous observed and documented O-Ring/Seal failures (at the factory and later extensively in the field) have **not** been addressed nor resolved. Defective hydraulic system designs, including inappropriate/incompatible hydraulic components (e.g. undersized Durst pump drives), have **not** been addressed nor resolved. Voluminous numbers of malfunctioning Gear oil Circulation Motors (GOCM)/Durst drives (at the factory and extensively in the field) have not been addressed sufficiently nor resolved. The issue of excessive hydraulic system pressures and related hydraulic component failures have not been addressed sufficiently nor resolved. I also believe the issue of hydraulic piping supplied by the contractor not in accordance with accepted industry standards has not been sufficiently addressed and there still exists an unreasonably high risk of injury/death to operators as well as for catastrophic failure to the hydraulic pumping system.

<u>The hydraulic pumps were **not** successfully testing in the field.</u>

Acceptance testing has **not** been accomplished as has been reported in the PSR, and, there remains serious and potentially catastrophic vulnerability issues surrounding same as there has never been a means employed to assure the mechanical integrity of the demonstrated defective hydraulic pumping equipment. A comprehensive review of the official USACE acceptance testing documentation, including all Quality Acceptance Reports (QAR's) for same, reveals the findings as reported in the PSR, with regards to this testing, are at best untruthful, at worst fraudulent, if in fact a comprehensive review of all available acceptance testing documentation was accomplished by reasonably capable engineers.

The acceptance testing the PSR contends happened in actual fact **never** took place. The acceptance testing data, as recorded by USACE Task Force Hope Quality Assurance (QA) personnel, shows that **none** of the hydraulic pumps were run at the official

contractually agreed to (required) Acceptance Testing Procedures, and, **none** of the hydraulic pumping equipment system operating parameters were recorded as contractually required (time/pressure/speed/oil temp/water temp/canal level/leaks/ambient conditions). In fact, these official USACE Quality Assurance QA records for the Acceptance Testing cited in the PSR **prove** the assertions made in the PSR are false.

Incredibly, on the dates the hydraulic pump acceptance testing was reported as completed successfully, "passed" (as reported to, and by, the GAO, DoDIG and Parsons), the actual data recorded and reported by USACE QA field personnel for these same hydraulic pumps show the following was actually **officially** recorded for the 40 hydraulic pumps cited:

- **8** of the 40 hydraulic pumps with no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **2** of the 40 hydraulic pumps with no record of any testing done at all.
- **12** of the 40 hydraulic pumps recorded as "ran" with no other testing data recorded (time/pressure/speed/oil temp/water temp/canal level/conditions/leaks).
- **7** of the 40 hydraulic pumps recorded as running 2 hours with no other testing data recorded.
- **5** of the 40 hydraulic pumps recorded as running 1.5 hours at with no other testing data recorded.
- **1** of the 40 hydraulic pumps recorded as running 2 hours at reduced speed/pressure and no other testing data recorded.
- **3** of the 40 hydraulic pumps recorded as failing the acceptance testing due to Durst Drive failures on the very day cited as "passing" same. A couple weeks later one of the pumps reported as "ran" for 2 hours with no other testing data recorded, another pump was retested and recorded as "passed" yet recorded hydraulic oil leaks and a GOCM that was not functioning properly, and no retest recorded for the other pump.
- **1** of the 40 hydraulic pumps recorded as failing the acceptance testing due to an O-Ring failure on the very day cited as "passing" same with no retest recorded as completed.
- **1** of the 40 hydraulic pumps recorded as failing the acceptance testing as it was in the by-pass mode – a couple weeks later recorded as retested and "passed" with no other testing data recorded.

In addition, QA recorded data shows in the few days after certain handful of hydraulic pumps supposedly "passed" acceptance testing some were used again to assist with helping achieve 'prime' for other neighboring pumps still needing to undergo acceptance testing – 3 of these hydraulic pumps experienced catastrophic hydraulic pump failures; two experienced O-Ring failures and one experienced a seal failure. Of important note, no other subsequent acceptance retesting data is recorded for any of these hydraulic pumps.

Also of important note, rainfall events as recorded by NOAA for the drainage basin associated with the three outfall canals for the entire acceptance testing period, provide physical evidence that pump acceptance testing runs, as cited in the PSR, were not possible (not enough water in the canals to run the hydraulic pumps as cited). It appears Parson has relied (like GAO and DoDIG?) on summary/executive summary/chronology documents given to them by New Orleans District (NOD) USACE Task Force Hope (TFH) instead of delving through the piles (and piles) of raw data.

Also troubling, reviewing the USACE acceptance testing documentation for each hydraulic pump, in conjunction with the vibration analysis that was done for a plethora of hydraulic pumps, along with related USACE QA reports, yields some very disturbing realities – as follows:

- In the Jan.-Mar., 2007 timeframe, all 40 hydraulic pumps were retrofitted with stronger/more robust rebuilt Rineer motors, and proclaimed by USACE TFH to have been successfully tested and ready for service during hurricane season if needed. These same hydraulic pumps are subsequently run (in a limited fashion) and experienced what can be characterized as catastrophic failures if occurred during a Hurricane event; i.e. O-Ring/Seal failures, hydraulic component failures, Durst Drive/Gear Oil Circulation Motors overheating, severe vibrations/pulsations during runs, and failure requiring replacement of the Rineer motor. Even with the limited USACE documentation available, still able to document **15 of the 40** hydraulic pumps in this category (and some with multiple failures).
- In the Mar. 2007 time frame, numerous hydraulic pumps undergo vibration analysis (13) and reported as concluding with positive/successful results. These same hydraulic pumps are subsequently run, in a limited fashion, with numerous pumps experiencing what can only be characterized as catastrophic failures; i.e. O-Ring/Seal failures, Durst pump drive not working properly, and hydraulic system close to overheating – there are even recorded pump runs where severe vibrations/pulsations are recorded. Again, even with the limited USACE documentation available still able to document **5 of the 13** hydraulic pumps in this category (and one with multiple failures).
- In the Jun. – Sept. 2007 timeframe, all the hydraulic pumps undergo acceptance testing and are reported as "passing", testing being successfully accomplished. These same hydraulic pumps are run on the day of passing acceptance testing to only a couple weeks subsequent, with numerous pumps reported as experiencing what can only be characterized as catastrophic failures; O-Ring/Seal failures, Durst Drive/Gear Oil Circulation Motors overheating, severe vibrations/pulsations during runs, etc.. Again, even with the limited USACE documentation available still able to document **8 of the 40** hydraulic pumps in this category.

The need for real/viable acceptance testing is still critical, it's imperative to insure the safety and welfare of the citizens of New Orleans. Without it there is no means to ensure the hydraulic pumps will function as they are required to by contract and design – that is,

survive being operated at full operating pressures/speeds (to provide as close to the minimum required flow rate) during the design storm event (apparently, per the PSR, a 10-year, 24 hour rainfall event – not the design 100-year storm event reported to Congress and the public).

The nature and content of the official USACE hydraulic pump acceptance testing data, the nature an content of the official USACE summary/executive summary/chronology documents given to various federal investigatory agencies in the course of the various investigations, and the obvious efforts to promote false/untrue contentions in order to avert further questions regarding the operability/suitability of the hydraulic pumping equipment, is such it gives rise to serious questions about malfeasance.

In summary, the hydraulic pumps were **not *successfully*** tested in the field.

<u>There **are** immediate vulnerabilities to catastrophic failure with the hydraulic pumping systems and/or their supporting systems.</u>

Contrary to the PSR, the existing potential vulnerabilities that could lead to catastrophic failure of the hydraulic pumping equipment are extensive; defective hydraulic system design, including inappropriate/incompatible hydraulic components (e.g. undersized Durst pump drives and hydraulic coil reservoirs), inability to assess the functionality of the installed hydraulic pumping equipment due to insufficient run times at appropriate speeds/pressures, unassessed cause for ongoing O-Ring/seal failures (in the factory and in the field), unassessed cause for numerous and extensive Durst drive failures ongoing in the field (likely due to undersized Durst pump drives), high pressure hydraulic piping not in conformance to Code and industry standards, etc..

<u>The hydraulic pumps called into duty during Hurricane's Gustav and Ike, were **not** needed in order to keep the city of New Orleans safe, and did **not** performed successfully.</u>

The reported contention that the hydraulic pumps were called into duty during Hurricane's Gustav and Ike, in order to keep the city of New Orleans safe, and, performed successfully, mocks how this investigative process should work. In addition, none of the pump run data reported in the PSR constitutes factual/truthful reporting.

The facts, and SACDA data, show storm surge as experienced at the gated closure structures, for hurricane Gustav **never** reached or exceeded the Safe Water Level (SWL) - had the gates never been closed for this event there would have been **no** adverse affect to the city of New Orleans from flooding.

In addition, during hurricane Ike, the facts, and SACDA data, show storm surge as experienced at the 17th Street gated closure structures **never** reached or exceeded the Safe Water Level (SWL). Had the gates never been closed at 17th Street for this event there would have been **no** adverse affect to the city of New Orleans from flooding. And, during hurricane Ike, the facts and SCADA data show storm surge did reach the SWL at London Avenue (5.0') with a maximum surge water level of 5.39'. However, what is not

reported in the PSR is during Hurricane Ike the hydraulic pumps were hardly run at all – they were relegated to 'exercise' type runs. At London Avenue, during hurricane Ike, it was the direct drive pumps that were utilized to initially bring canal water levels down, and it was direct drive pumps that were utilized to maintain these same water levels prior to any hydraulic pumps ever being turned on and operated. In fact, direct drive pumps were run over five (5) hours at London Avenue during hurricane Ike before a handful of hydraulic pumps were even turned on, and run at very limited speeds/pressures (between 30-70% of operating pressures/speeds), and for very limited periods of time (1 pump for one hour at reduced pressures/speeds, 2 pumps for 2.5 hours at reduced pressures/speeds, and 3 pumps for 45 minutes at reduced pressures/speeds).

After publically acknowledging USACE was severely limited in their ability to run hydraulic pumps for testing due to "insufficient water levels" in the outfall canals during anything but extremely heavy rainfall events (*not*, USACE was limited because of their own design flaw which leaves the hydraulic pumps 2' short of the intended pump-on elevation), USACE Task Force Hope personnel publically indicated all efforts would be made to run the hydraulic pumps during any future heavy rain events in order to give them more operational run time. Yet, <u>for both Hurricane events</u>, the facts, and data, show **none** of the hydraulic pumps were operated to initial bring canal water levels down at any of the outfall canals – when canal water elevations were the greatest - <u>not</u> <u>one</u>. Only Direct Drive pumps were initiated and operated to maintain and bring initial canal water levels down in all outfall canals. The hydraulic pumps were not utilized when the highest canal water levels were present in the beginning, were not allowed to run at full operating speeds/pressures, nor allowed to run for extended periods of time - they were instead relegated to an "also pumped" status that was turned into a straw man for hydraulic pump performance. The recorded storm data shows clearly the hydraulic pump runs were not examples of pumping performance that replicates that as seen in a true Hurricane event, they are examples of what can be called "demonstration"/"exercise" runs.

To demonstrate for Hurricane Gustav, only after the Direct Drive pumps were initially operated and the water level was significantly reduced at London Ave. outfall canal (4.3-3.3'), and the Direct Drives proved themselves to be capable and efficient (1' drop in 30 min.), were hydraulic pumps then turned on and operated in a limited fashion. And, at 17th St. outfall canal, only after the Direct Drive pumps were initially operated on two separate occasions over what appears to be a 5.5 hr period were the hydraulic pumps then turned on and then operated in a limited fashion.

To demonstrate for Hurricane Ike, only after the Drive pumps were initially operated and the water level was significantly reduced at 17th Street outfall canal (5.2-2.9'), and the Direct Drives proved themselves to be capable and efficient (1.7' drop in 1 hour), were hydraulic pumps then operated in a limited fashion. And, at London Ave. outfall canal, only until the Direct Drives were operated for over 5 hours (once for an hour, and again for four (4) straight) were the hydraulic pumps then operated in their limited fashion.

For Hurricane Gustav, the hydraulic pumps were run intermittently and on an extremely limited basis. At the 17th Street outfall canal, the 18 hydraulic pumps were only run, on

average for each hydraulic pump run for the entire storm event, 3¾ hours each total, and incredibly, 30% of the run time was in the 20-65% operating speed range, 50% of the run time was in the 70-85% operating speed range, and 20% of the run time was in the 90-95% operating speed range. At the London outfall canal, the 12 hydraulic pumps were only run, on average for each hydraulic pump run for the entire storm event, 7 2/3 hours each total, and more incredibly, 44% of the run time was in the 20-65% operating speed range, 55% of the run time was in the 70-85% operating range, and statistically, only 1% of the run time was in the 90-95% operating range.

For Hurricane Ike, the hydraulic pumps runs were even more severely restricted. At 17th Street outfall canal six (6) of the 18 hydraulic pumps were not even run. The remaining 12 hydraulic pumps were only run, on average for each hydraulic pump run for the entire storm event, 2 hours each total, and incredibly, 30% of the run time was in the 55-65% operating pressure range, 35% of the run time was in the 70-85% operating pressure range, and 35% of the run time was in the 90-95% operating pressure range. At the London Avenue outfall canal one (1) of the 12 hydraulic pumps was not even run. The remaining 11 hydraulic were only run, on average for each hydraulic pump run for the entire storm event, 1 ½ hours each total, and more incredibly, 65% of the run time was in the 20-65% operating pressure range, and 35% of the run time was in the 70-75% operating pressure range. To contrast, the eight (8) Direct Drive pumps at London outfall canal were run, on average for each direct drive pump run for the entire storm event, over 4 times longer than that of the hydraulic pumps.

For both Hurricane events, the Direct Drive pumps were the workhorses with regards to what pumps did the lion's share of the pumping during both hurricane events – the hydraulic pump runs can be categorized as extremely limited and more in kind to exercise/demonstration level pump runs. Also, to put in further context, this even though there was a limited amount of pumping available during both Hurricane events.

Even more importantly, the actual pump run data reveals that TFH and NOD did not have good faith the hydraulic pumps would operate as required. This is evidenced by the nature of how the hydraulic pumps were operated, by executing exercise/demonstration level pump runs, coupled with not operating a single hydraulic pump to initially bring canal water levels down at both outfall canals during both Hurricane events. Only Direct Drive pumps were initiated and operated when it was necessary to start pumping once the gates were closed. TFH & NOD had the opportunity to finally be able to run more than one or two hydraulic pumps at design level conditions (full operating speeds/pressures) for more extended periods of time – something they were previously unable to do due to previously insufficient canal water levels – something they previously publically stated they would seek to do (to overcome "insufficient water levels" issues - due to the Corps pump-on elevation design flaw). They purposely chose to not to do this…and instead chose to run hydraulic pumps at canal levels that severely limited their operational capability and endangered their mechanical integrity due to pumping at less than design pump-on water elevations.

Additional documentation will show clearly that high level USACE TFH personnel attempted to report patently false performance evaluations for the hydraulic pumps during Hurricane Gustav to the highest USACE command levels - official reporting forward that constitutes an organized white wash intended to provide cover as to the true condition of the hydraulic pumping equipment.

Finally, and incredibly, the PSR makes the argument for and incorporates throughout its analysis, regarding the suitability of the equipment in question, two (2) false premises that leave the undersigned almost speechless – they are as follows:

- Our hydraulic pumping equipment was designed for a 10-year, 24 hour rainfall, storm event, ergo, any analysis the PSR reports will incorporate this lessened design storm event.
- Our hydraulic pumping equipment was only meant to have a limited/shortened lifespan of 5-7 years, not the industry standard for similar hydraulic pumping equipment (50 years) – ergo, any analysis the PSR reports will incorporate this shortened lifespan.

As will be discussed in detail further on, the hydraulic pumping equipment in question was designed for a 100-year storm event. This has been documented extensively, including reported officially to Congress, and, reported extensively to the public.

As has already been mentioned previous, and will be discussed in detail further on, the hydraulic pumping equipment in question was procured with the intent of being able to operate successfully for a minimum 50-year period. This too has been documented and even recorded during a public meeting between the TFH Commander and various New Orleans officials.

The attempt of the PRS to base findings on such faulty premises paints these findings with no credibility In addition, this attempt on Parsons part to camouflage the failings and vulnerabilities of the object of their focus is an affront, and I believe a miscarriage of their duties as engineers. As engineers they are duty bound to ultimately use their expertise in service to the citizens their work will affect – not the self interests of the persons/entities paying for their engineer service.

After a thorough review, the PSR can only be defined as a document completely without credibility. It's findings are not based on an analysis of the facts as they exist(ed) nor any real rigorous engineering and mathematical interpretation, and, can be refuted with a plethora of documentation to the contrary that can effectively demonstrate egregious untrue statements in fact, false demonstrations, blatant errors, mischaracterizations, and omissions of significant scale.

SECTION 2 – Point-By-Point Response to the PSR

In an attempt to maintain clear and easy to follow responses in this Section I will provide my responses to specific issues as they are presented in the PSR. In addition, when responding I will reference first that portion of the PRS and enclose same in a box outlining same – this in order to ensure the reader is clear what portion of the Response in this Section is directly taken from the PSR.

PSR: ES-1 to ES-3

Executive Summary

For opinions as generally presented by Parsons in this Section, as might be obvious, my response is in direct conflict to theirs and is as that presented in Section 1. – "Summary Response".

PSR: ES-1

Executive Summary...

...Approximately 16,600 cubic feet per second (cfs) (7.5 million gallons per minute [gpm]) in pumping capacity was designed, procured, constructed, and tested in approximately 21 months.

The pumping capacity numbers reported by the PSR are incorrect – 20 rental hydraulic pumps are included in this total. See Table 1-1 of the PSR. Total pumping capacity, as designed, procured, constructed and tested is somewhere around 14,500 cfs (using 200 cfs per hydraulic pump), and, 4,500 cfs of this is attributable to the direct drive pumps.

PSR: ES-2

Executive Summary...

...Once the MWI factory visit was completed, the USACE Jacksonville District Quality Assurance (QA) team was interviewed to obtain their first hand observations during the hydraulic pump fabrication and testing. The QA team substantially confirmed the observations documented in the DoDIG and GAO reports.

Just what observations and portions (all?) of the cited DoDIG and GAO reports are the USACE Jacksonville District QA team supposedly confirming? The QA team did not have exposure nor substantial involvement in the bulk of the issues brought forward for investigation through the efforts of these cites investigations and subsequent reports – this appears to be an attempt to paint with a broad brush concurrence from outside sources as lending credence....where none exists. From my personal first hand experience it is my

strong belief the lead engineer from the USACE Jacksonville District in charge of all QA for this project would not agree with this statement made by Parsons.

PSR: ES-2
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Executive Summary...

...The findings and conclusions of the Parsons team are as follows:

...Based on the information provided and the interviews performed, the Parsons team found that there were issues with the factory testing and changes to testing procedures by USACE that took place during the testing process. Further investigations also show issues raised by the whistleblower have been rectified in the field and the pumps re-tested for full functionality. Therefore, it is the Parsons team's opinion that the hydraulic pump systems have been adequately tested for their intended purpose.

Issues I have raised have NOT been rectified in the field nor the pumps "re-tested" in the field for full functionality (acceptance testing). Further detailed rebuttal to this issue is provided in Section 3. – "Additional/Supplemental Rebuttal to the PSR"

In addition, the statement the PSR makes with regards to changes to the testing procedure is misleading and mischaracterizes my original issue regarding inappropriate relaxing of the factory testing requirements – please see original Affidavit and original Response to DoDIG Report for a detailed discussion regarding same. USACE allowed changes to the factory testing procedures (10 times) that were promulgated by repeated failures of the hydraulic pump manufacturer to meet the contractually required factory testing requirements – ergo, lessen the requirements until more pumps could "pass" the relaxed factory testing requirements. This bargain is the leading factor in defective hydraulic pumping equipment being delivered to New Orleans. Also of important note, this bargain is the reason none of the completed hydraulic pumping systems has ever been able to be run at full contractual operating speeds/pressures, and, even when run at lesser speeds/pressures none of the hydraulic pumping equipment has been able to sustain any significant run time, mainly due to the USACE design flaw that leaves the hydraulic pumps at least 2' short in the required design submergence (there is not enough water in the outfall canals to run the hydraulic pumps for any meaningful length of time with without serious risk to the hydraulic systems).

This issue has been extensively discussed by me in numerous submitted documents (MFR - Factory & Field Testing & Docs , original Affidavit, supplemental Affidavit, and original Response to DoDIG Report. In addition further detailed rebuttal to this issue is provided in Section 3. - "Additional/Supplemental Rebuttal to the PSR".

PSR: ES-3

Executive Summary...

...The findings and conclusions of the Parsons team are as follows:

....It is the opinion of the Parsons team that as long as the permanent facilities proceed according to schedule and a thorough inspection and maintenance program is followed for the temporary facilities, there are no immediate vulnerabilities to catastrophic failures with the hydraulic pumping systems or their supporting systems.

The potential vulnerability to catastrophic failure of the hydraulic pumping equipment is NOT limited to these two identified issues. The actual potential vulnerabilities that could lead to catastrophic failure of the hydraulic pumping equipment is extensive – defective hydraulic system design, inability to assess the functionality of the installed hydraulic pumping equipment due to insufficient run times at appropriate speeds/pressures, incompatible hydraulic components, unassessed cause for ongoing O-Ring/seal failures (in the factory and in the field), unassessed cause for numerous and extensive Durst drive failures (ongoing in the field), etc.. Further detailed rebuttal to this issue is provided in Section 3 – "Additional/Supplemental Rebuttal to the PSR"

PSR: ES-3

Executive Summary...

...The findings and conclusions of the Parsons team are as follows:

...On August 31, 2008, Hurricane Gustav made land fall...

...which generated a storm surge in Lake Pontchartrain of 4.8 feet. Records show that the USACE canal teams received orders to close the canal gates at the temporary outflow canal pump stations at the 17th Street and London Avenue canals, cutting off the canals outflow to Lake Pontchartrain in anticipation of the storm surge associated with the high winds. Pumps were put into service and the two canals were successfully kept at the safe water levels. The Orleans Avenue gates were not shut as the water levels were at a safe level...

...On the morning of September 12, 2008, Hurricane Ike made land fall...

...generating a storm surge in Lake Pontchartrain of approximately 5.2 feet. The coast experienced rain and winds of around 25 mph and at the temporary pump stations, the USACE canal team received orders to close the canal gates cutting off the canals' outflow to Lake Pontchartrain. Again pumps were put into service and the two canals were successfully kept at the safe water levels. The Orleans Avenue gates were not shut as the water levels were

> below its designated safe level....
>
> ...It is the opinion of the Parsons team that the temporary hydraulic pumping systems performed successfully, keeping the water levels of the canals at the determined safe level for both hurricanes.

The SACDA data, as provided by USACE for this event, proves Hurricane Gustav posed little to no danger to the city of new Orleans (from flooding) with its reported maximum outfall canal surge of only 4.71' reported at the London Ave. ICS Lake Side Level, and 2.45' at 17th St. Lake Side Level. Official USACE "Protocol" called for gate closure and pumps operational if surge was expected to equal or exceed outfall canal safe water level (SWL); Orleans Ave. SWL = 8', 17th Street SWL = 6', and London Ave. SWL = 5'. The only outfall canal that even approached the need of any pumping capacity was Orleans Avenue, even if it was marginal at best. Pump run SCADA data for London Avenue and 17th Street outfall canals confirms this. If gates did not close, and no hydraulic pumps ran at any of the three outfall canals during Hurricane Gustav the city of New Orleans would not have experienced any adverse affects. This rebuttal is further detailed in Section 3 – "Additional/Supplemental Rebuttal to the PSR".

In addition, the SACDA data, as provided by USACE for Hurricane Ike proves this event posed little to no danger to the city of New Orleans (from flooding) with its reported maximum outfall canal surge. The Maximum surge experienced at the Lake Side of 17th Street during Ike was 3.66' – if the gates had never been closed this would have been the maximum canal water level experienced at 17th St.

And, again, during hurricane Ike, the facts and SCADA data show storm surge did reach the SWL at London Avenue (5.0') with a maximum surge water level of 5.39'. However, what is not reported in the PSR is during Hurricane Ike the hydraulic pumps were hardly run at all – they were relegated to 'exercise' type runs. At London Avenue, during hurricane Ike, it was the direct drive pumps that were utilized to initially bring canal water levels down, and it was direct drive pumps that were utilized to maintain these same water levels prior to any hydraulic pumps ever being turned on and operated. In fact, direct drive pumps were run over five (5) hours at London Avenue during hurricane Ike before a handful of hydraulic pumps were even turned on, and run at very limited speeds/pressures (between 30-70% of operating pressures/speeds), and for very limited periods of time (1 pump for one hour at reduced pressures/speeds, 2 pumps for 2.5 hours at reduced pressures/speeds, and 3 pumps for 45 minutes at reduced pressures/speeds).

This rebuttal is further detailed in Section 3 – "Additional/Supplemental Rebuttal to the PSR", 3.3 "Hydraulic Pump Runs During Hurricanes Gustav and Ike".

As discussed previously in Section 1 – "Summary Response" – the hydraulic pumps run performance, for both hurricane events, cannot be considered successful – successful here in this context would mean the hydraulic pumps were tested/run under real Hurricane flooding conditions, at full operating speeds/pressures for continuous and extended periods of time. Nothing of this sort was even remotely realized for the hydraulic pumps

in question. This rebuttal is further detailed in Section 3 – "Additional/Supplemental Rebuttal to the PSR".

PSR: 1-2

Section 1 – Introduction

1.1 Background...

1.2 Scope

... The overall objectives of the assessment are to review the adequacy of testing of the temporary pumping systems and to identify and assess vulnerabilities of the hydraulic pumping systems to failures in the event of a hurricane (specifically a 10-year, 24-hour rainfall event to which USACE designed the systems)....

It appears the PSR bases its analysis/assessments on a fundamentally faulty premise (by which they measured thing by). The design rainfall event is **not** a 10-year 24 hour rainfall event. Per USACE's own formal/official reports to various federal entities, and voluminous public statements, the interim closure structures with hydraulic pumps installed was designed to provide a 100-year level of protection – this is a level of protection equivalent to Hurricane Rita (comparing, Katrina was a 396 year storm).

PSR: 2-3 to 2-4

2.4 Factory Testing....

...Typically, these types of tests are not witnessed by the purchaser as they are identified and resolved by the fabricator before the inspection effort. Furthermore, witnessed events are typically limited to the startup and commissioning of a pump station except in cases where the specifications require witnessed pump and driver testing events.

2.4.1 Factory Testing of the Hydraulic Pumping Units

...The testing program originally called for each unit to be tested statically for 90 minutes at design pressure and dynamically for 15 minutes at maximum speed, pressure, and temperature.

...As documented in other reports, some component failures occurred during the factory tests. The subject components were repaired or replaced and tests resumed.

Recognizing the critical schedule constraints to have the pumps on site, ready to operate

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↓

test and logged 25 running hours.

2.4.1.1 Findings

While there are standards related to the hydraulic performance of pumps of this type,

↓

↓

additional field testing to ensure pump operation and endurance.

For this procurement, nothing could be further from the truth. This was an emergency procurement where all hydraulic pumps arriving at the job site in New Orleans were required to be installed, commissioned and ready for service should a Hurricane be approaching the city. This was not a procurement done under "normal" conditions where extensive/laborious field testing was provided for. The contract requirements for this project, as provided for in the awarded contract, specifically provided for factory testing to be witnessed by the government and allowed for testing at the factory that would ensure each hydraulic pump would be run at full operating speeds/pressures for significant amounts of time that would ensure the mechanical integrity of the hydraulic pumping equipment.

Next, the statement the testing program originally called for each pump to be tested dynamically for 15 minutes at maximum speed, pressure, and temperature is an incomplete one, and, left on it's own misrepresents the actual dynamic testing required by the contract, thereby misleading the reader.

The original factory dynamic testing specified by the contract called for a dynamic test **conducted in a horizontal variable speed dynamometer**, capable of varying torque loads from 0 to maximum required horsepower as specified while running the hydraulic pumps at maximum operating speeds, pressures and temperatures (and, in accordance with HI Standards for type of dynamic testing specified). What is not stated here is the Contractor (MWI) did not have a variable speed dynamometer and asked the Corps for a variance – put the pumps into a testing tank and run the pumps over the operating range to simulate loading the hydraulic pumping system (in lieu of loading accomplished by the dynamometer). Also of note, USACE granted this request, but did so with the understanding all testing would continue to be done in accordance with HI Standards. By the very act of the contractor changing the loading mechanism this by definition was destined to increase the dynamic testing time as the loading of the pumps was no longer easily accomplished – again, due solely to the actions of MWI and USACE's concurrence with same.

Next, components failures, occurring at the factory and during the factory Tests, where **not** repaired or replaced and tests resumed. Using just one example, over 40% of the Denison hydraulic pumps were shipped from the factory and installed in the field, all while being touted as in perfect condition, but later found to be in such a state of failure that they required immediate replacement (shredded port plates, scoured cams, etc.). Please refer to my Declaration, my Affidavit, and my response to the first DoDIG report.

For a complete and thorough discussion of all this subject matter please refer to the following document: "MEMORANDI FOR RECORD - Factory Testing Requirements and Field Testing Requirements of the Pumping Equipment as Provided For by Contract No. W912P8-06-C-0089:"

Next, the PSR characterization of the factory testing accomplished is such it completely rewrites history. Only 10 of the original Pump Assemblies was ever put in the testing tank to pump water, one was only run 1 couple minutes, and another run at 1/3 speeds/pressures (hydraulic coil did not even warm enough to register). Of these 10 pump assemblies ½ experienced catastrophic failures. There were additional test failures due to; a dozen of more Denison hydraulic pump failures; and ½ dozen or more high pressure hydraulic line failures, gear oil circulation motor failures, and loss of pressure/excessive hydraulic oil temperatures. That's only what is known, not what actually occurred.

There is no record of two DUs (not one as reported in the PSR) passing any form of testing (even the lessened version). In addition, these units, DU 8840 and DU 8852, were installed in the field and there is no record of either being run successfully or recorded as passing acceptance testing. The only field run records show a plethora of various hydraulic system failures when trying to run pumps with these drive units.

The PSR attempts to justify a backing away from the required testing requirements and rewrites what those actual requirements should be. The fact remains our contract called for specific testing requirements that were a deliverable – we paid top dollar for it. Please refer to the above cited MRF, my original Declaration and Affidavit for an in depth discussion on this mater.

None of the abnormalities experienced during the factory testing was addressed – even the changed out GOCM change out did not solve the Durst Drive overheating problem as first thought (USACE field records prove this). And finally, there was no additional field testing accomplished that took the place of the lessened testing done at the factory – it couldn't have happened unless a storm was present (not enough water in the canals to run pumps for any meaningful time period due to the USACE design flaw). And, as will be shown later, this testing did not even happen during the subsequent two storm events (as the SCADA data will demonstrate).

PSR: 2-4 to 2-8

2.4.2 Factory Prototype Performance Test

All

2.4.3 Factory Scaled Model Test

All

I have no comment.

PSR: 2-8

2.4.4 Hydrostatic Tests

The water pump units were tested hydrostatically for 90 minutes to check for leaks. The process included raising the pressure in the high-pressure plumbing (hose) and the pump head to 3200 psi while restraining the propellers with wood blocking to induce the test pressure. Hydrostatic test data from a Jacksonville QA report indicates that all static tests conducted on the pump units successfully met the specified requirements.

2.4.4.1 Findings

All of the pump casings passed these tests. Records show some pumps tested were not initially successful and that these pumps went through corrections and further testing. The types of malfunctions noted in the reports during equipment testing are considered normal in an industrial manufacturing environment. The Parsons team's opinion is that the pumps were conclusively tested to an acceptable operational standard.

All of what the PSR reports here is false.

The actual static testing requirement changes three times over the life of the factory testing for the original pump assemblies. At first 90 min static testing in accordance with HI Standards was as the contract required. As was all things, MWI objected to this, asked for, and received, lessened static testing requirements which included "dead heading" the pumps – jam the impeller to keep it from turning and engage the pump assemblies. This could only be done for a minute or two as temperatures rose quickly and the pump assemblies had to be turned off or they would end their run with a large disengagement "bang" that would send the mechanics in the area scrambling. Only **4** pump assemblies were tested using this method. The last static testing requirement were restored more to the original except instead of testing to 1.5 times operating pressures (4,800 psi) they tested to 0.93 times operating pressures (3,000 psi). Only **25** of the original 34 pump assemblies pass this revised static testing. The remaining **5** pump assemblies have no record of any static testing ever accomplished where the pump assemblies were either "dead headed" or tested for 90 min. with an outside pressure source.

PSR: 2-8

2.5 Field Testing…

2.5.1 Performance Testing

No comment.

PSR: 2-10

2.5 Field Testing…

2.5.2 Acceptance Testing

The field acceptance tests for each complete system included running at least 2 hours at an engine speed of 1,800 rpm and a hydraulic pressure of 3,200 psi. Steady-state conditions, engine rpm, engine jacket temperature, hydraulic system oil pressure and temperature, leakage (required: none), and canal level were monitored. These tests were conducted on each hydraulic pumping system by the contractor with oversight by USACE. USACE documented any deviations from the testing parameters including pump speeds, run times and temperatures.

The documentation showed all abnormalities previously identified in the pump manufacture and installations were corrected prior to the acceptance tests….Most abnormalities were corrected by September, 2007, with a few minor issues still noted in the punch list for the drive units….

Nothing as reported in the PSR here is truthful. Per the official USACE QA Reports for all the acceptance testing conducted the following represent what <u>are</u> truthful statement:

- **None** of the hydraulic pumps undergoing field acceptance testing ran at least 2 hours at an engine speed of 1,800 rpm and a hydraulic pressure of 3,200 psi.
- **None** of the hydraulic pumps undergoing field acceptance testing had their steady-state conditions recorded – i.e.; engine rpm, engine jacket temperature, hydraulic system oil pressure and temperature, leakage (required: none), and canal level were monitored.
- USACE did **not** document any deviations from the testing parameters including pump speeds, run times and temperatures.
- The documentation did **not** show all abnormalities previously identified in the pump manufacture and installations were corrected prior to the acceptance tests – in fact documentation shows numerous pumps experienced subsequent catastrophic failures after supposedly passing stated acceptance testing.
- All significant abnormalities were **not** corrected by September.

PSR: 2-10

2.5 Field Testing…

2.5.2 Acceptance Testing…

A review of the acceptance test results of the pumps follows….

2.5.2.1 London Avenue

Acceptance tests for the London Avenue Canal pumps started in July 2007. The test results indicate that fully loaded run tests were performed on 12 pumps at the site. Out of the 12 pumps tested, 9 pumps passed the initial acceptance tests. Functional abnormalities such as oil leaks, high oil temperature, and overheating gear oil caused the 3 pumps to fail the initial tests. These abnormalities were corrected and the 3 pumps then passed the running test as shown on the pump acceptance log, dated November 2007.

Again, nothing as reported in the PSR here is truthful. Per the official USACE QA Reports for, all the acceptance testing conducted, the following represent what are truthful statements for acceptance testing conducted at the London Avenue Outfall Canal:

- **2** of the 12 hydraulic pumps with no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **1** of the 12 hydraulic pumps recorded as "ran" with no other testing data recorded (time/pressure/speed/oil temp/water temp/canal level/conditions/leaks).
- **6** of the 12 hydraulic pumps recorded as running 2 hours with no other testing data recorded.
- **2** of the 12 hydraulic pumps recorded as failing the acceptance testing (Durst Drive overheating) on the very day cited as "passing" same. A subsequent retest showed one pump reported as "passing" retest yet experiencing hydraulic oil leak and GOCM unable to disengage, and, the other pump reported as "ran" for 2 hours with no other testing data recorded.
- **1** of the 12 hydraulic pumps recorded as failing the acceptance testing as the pump was in by-pass mode. Subsequent retesting cited the pump as "ran" with no other testing data recorded.
- **1** of the 12 hydraulic pumps record as previously "passed" acceptance testing was run almost two weeks later and experienced a hydraulic oil leak at the Denison hydraulic pump.

PSR: 2-10

2.5 Field Testing…

2.5.2 Acceptance Testing…

A review of the acceptance test results of the pumps follows….

2.5.2.1 London Avenue…

2.5.2.2 Orleans Avenue

Acceptance tests for the Orleans Avenue Canal pumps started in June, 2007. Functional abnormalities, including a damaged seal, leaking bearing o-ring and underwater oil leaks, occurred with 3 pumps. These abnormalities were corrected by August, 2007 and the pumps were re-tested. All passed the running test as shown on the pump acceptance log,

dated November, 2007.

Nothing as represented in the PSR here is truthful. Per the official USACE QA Reports for, all the acceptance testing conducted, the following represent what are truthful statements for acceptance testing conducted at the Orleans Avenue Outfall Canal:

- **4** of the 10 hydraulic pumps with no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **2** of the 40 hydraulic pumps with no record of any testing done at all.
- **2** of the 10 hydraulic pumps recorded as "passed" with no other testing data recorded (time/pressure/speed/oil temp/water temp/canal level/conditions/leaks).
- **1** of the 10 hydraulic pumps recorded as running 2 hours with no other testing data recorded.
- **1** of the 10 hydraulic pumps recorded as running 1.5 hours with no other testing data recorded.
- **1** of the 10 hydraulic pumps reported as "passing" is simultaneously reported as failing the acceptance test 10 min into the test run due to a suspected hydraulic oil leak in a subsequent email.
- **1** of the 10 hydraulic pumps, with a failed seal reported 5 days prior to acceptance testing, is reported as "passing" yet no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **2** of the 10 hydraulic pumps record as previously "passed" acceptance testing were run almost two weeks later and both experienced catastrophic failures – one experienced O-Ring failure, the other failed Seals.

PSR: 2-10 to 2-11

2.5 Field Testing…

2.5.2 Acceptance Testing…

A review of the acceptance test results of the pumps follows….

2.5.2.1 London Avenue…

2.5.2.2 Orleans Avenue…

2.5.2.3 17th Street

Acceptance tests for the 17th Street Canal pumps started in August, 2007. The test logs of September, 2007 indicate 10 out of 18 pumps underwent the fully loaded test and all 10 pumps passed. No functional abnormalities occurred with these ten pumps. The remaining 8 pumps were tested by September, 2007 with all 8 pumps passing. Quality Assurance Reports show that due to low canal levels, some pumps were run at reduced

speeds of 1400 rpm and some pumps were tested for shorter periods of 1.5 hours during pump tests. These pumps were, however, also deemed to have passed the acceptance tests by the USACE Quality Assurance Team because performance was demonstrated upon reaching 45 minutes of steady state conditions.

Nothing as represented in the PSR here is truthful. Per the official USACE QA Reports for, all the acceptance testing conducted, the following represent what are truthful statements for acceptance testing conducted at the 17th Street Outfall Canal:

- **2** of the 18 hydraulic pumps with no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **9** of the 18 hydraulic pumps recorded as "ran" with no other testing data recorded (time/pressure/speed/oil temp/water temp/canal level/conditions/leaks).
- **4** of the 18 hydraulic pumps recorded as running 1.5 hours at with no other testing data recorded.
- **1** of the 18 hydraulic pumps recorded as running 2 hours at reduced speed/pressure and no other testing data recorded.
- **1** of the 18 hydraulic pumps recorded an O-Ring failure on the very day cited as "passing" same – no retest recorded and other testing data recorded.
- **1** of the 18 hydraulic pumps recorded a Durst Drive did not work properly on the very day cited as "passing" same – no retest recorded and other testing data recorded.
- **1** of the 18 hydraulic pump run the day before acceptance testing reported as overheating – on the day of acceptance testing recorded as "ran" with no other testing data recorded.
- **1** of the 18 hydraulic pumps previously reported as "passing" acceptance testing is run one week later and experiences excessive vibrations during the attempted run. This same pump was run a week after this and again reported as experiencing excessive vibrations.

PSR: 2-11

2.5 Field Testing…

2.5.2 Acceptance Testing…

2.5.2.1 London Avenue…

2.5.2.2 Orleans Avenue…

2.5.2.3 17th Street…

2.5.2.4 Findings

All 40 pump systems were finally accepted. It is the opinion of the Parsons team that

there was due diligence in the inspection and correction of any functional abnormalities throughout the testing. Abnormalities encountered were normal to the commissioning and startup of this type of equipment.

The findings as presented here have no standing – they are baseless as evidenced by a complete lack truthful evidence to rely on. Simply parroting what is presented in a summary report produced by the very persons that have served to mislead and dissuade further investigation into the defective pumping equipment is insufficient. The PSR states, and the original DoDIG report also states, USACE documented the acceptance tests for all 40 hydraulic pumps with quality assurance reports (QARs) which recorded the testing parameters, including pump speeds, run times, temperature, and deviations from any of the test procedures. If only the PSR addressed these actual QA reports maybe we would not continue to delve down the same corridors of deception and misinformation. A review of the actual USACE QA reports for all acceptance testing provide a much different picture of the actual acceptance testing accomplished, or better yet, not accomplished.

PSR: 2-11

2.6 Laboratory Physical Sump Model Testing

Unable to Comment – requested a copy of the cited studies from the author, Dr. Stephen T. Maynord, and was told I could not have them.

Dr. Maynord informed me the subject studies were initiated by a request from USACE New Orleans District (NOD) personnel (funds to do these studies provided by NOD) and he would have to call them to ask permission to release them to me. Initially Dr. Maynord indicated this should not be a problem (I am a fellow USACE engineer). Dr. Maynord subsequently contacted me to inform me NOD told him he could not release these documents to me…

PSR: 2-15

2.7 Conclusions…

2.7.1 Factory

All

This sections regurgitates what has already been said previously and previously commented on by me.

Please see previous comments, and, please see "MEMORANDI FOR RECORD - Factory Testing Requirements and Field Testing Requirements of the Pumping Equipment as Provided For by Contract No. W912P8-06-C-0089:"

The PSR refuses to acknowledge the contract requirements, refuses to acknowledge this procurement was not a "normal" pump procurement with inherent deliverable differences to those of common and usual pump projects. Original contract intent was all mechanical integrity testing **had** to have been accomplished at the factory to meet the operational schedule - regardless of how the testing requirements were seeded during the factory testing when hydraulic pumps were found to be unable to meet them and conform to the original delivery schedule.

The PSR refuses to acknowledge the contractor was given ample time to ready his testing facility before government QA representatives were called in – in fact the schedule slipped a week and a half allowing the contractor to be completely ready before calling for notifying they were ready to commence official testing. The PSR also refuses to acknowledge what was witnessed at the factory in the way of hydraulic pump failures was **not** normal to the industry - 50% of all pump assemblies actually pumping water experienced catastrophic failures while attempting to pump water, hydraulic pumps experiencing violent vibrations with no apparent cause nor any effort made by the KTR to rectify (only to later to manifest again in the field), large numbers of hydraulic pumps failing only to later learn 40% of those that "passes" and were sent on to the field and installed were actually in a state of failure....and on, and, on, and on....none of this is normal to the industry.

The PSR also refuses to acknowledge that full size testing of the pumps in the testing tank was something the contractor, MWI, asked to do, not USACE – original load testing was to have been accomplished using a variable speed dynamometer, and, MWI asked for, and received, permission to substitute. The PSR is hypocritical in that they disregard that which is owed the government and instead chastise the government for requiring same, even when it's the contractor that initiated the substitute deliverable....

How could the factory tests have been adequate and the response to correct the failures in the field suitable? This is an absurd position to take. Not surprising to me is the PSR refuses to acknowledge the very nature regarding the chronology of the morphing of the factory testing requirements culminating in an attempt to bribe a lower grade USACE employee to 'look the other way' – such behavior (on both parts, MWI and USACE) speaks volumes to the true intent at hand; to push the failing pumping equipment as fast as possible out the door, into the field, where we then had no truly adequate means available to address the problems that would ensue. And, you can't address problems you don't acknowledge as having. We had pumps in a failing state that were now installed in the middle of canals, no means to test run them due to inadequate water levels, and any need to remove pump assemblies for repairs would now require herculean efforts – however, the biggest problem was USACE had no will to even acknowledge there was even anything wrong with the hydraulic pumps in question and reported them as perfect hydraulic pump specimens as they were being installed at all outfall canals. Where was there the will to correct the deficiencies? Only after repeated MFR's, Official filings of Declarations, Affidavits, formal OSC filing.....where was the free will of USACE TFH to solve this problem...without my insistence? The standard of suitable

response the PSR should have used is not the reactionary actions of USCAE to this problem, but the proactive actions by USACE to the problem.

PSR: 2-16

2.7 Conclusions...

2.7.1 Factory...

2.7.2 Field

The acceptance and endurance testing in the field was performed in general conformance with industry standards. The anomalies experienced during the acceptance testing are consistent with the types of anomalies normally experienced during the startup phase of permanent pump stations designed and constructed for USACE. Correction and retesting is typically administered until the witnessed anomalies are eliminated and there are no other anomalies experienced. The acceptance testing documentation indicates consistency with this industry standard.

This section also regurgitates what has already been said previously and previously commented on by myself.

Please see previous comments. Also, please Section 3.1 "Acceptance Testing" for additional rebuttal to this issue.

To recap a response to this section of the PSR; the acceptance testing the PSR contends happened in actual fact **never** took place. When using data as recorded by USACE Task Force Hope QA personnel, **none** of the hydraulic pumps were run at the official contractually agreed to (required) Acceptance Testing Procedures, and, **none** of the hydraulic pumping equipment system operating parameters were recorded as contractually required (time/pressure/speed/oil temp/water temp/canal level/leaks/ambient conditions). In fact, official USACE Quality Assurance QA records for the Acceptance Testing cited in the PSR **prove** the assertions made in the PSR are false.

The actual condition of the hydraulic pumps that "pass" acceptance testing has been discussed previous and will be discussed further in later Sections.

PSR: 3-1

Section 3 – Vulnerability Analysis

3.1 Purpose

.....Substantially witnessed abnormalities of the pumping systems were observed during the fabrication and assembly processes. As discussed in

previous sections these types of tests are not typically witnessed by the purchaser as they are identified and resolved by the fabricator before the inspection effort. Therefore, the observations by the witnesses during fabrication are considered in-progress observations. Witnessed underperformance and the resolution of those conditions were considered in this report. The Parsons team's vulnerability analysis focuses on the final configuration and performance records of the system as it currently exists at all three canal outfall locations, which is a better indication of actual vulnerability of the system.

A vulnerability analysis that specifically omits the plethora of witnessed and documented hydraulic system failures occurring at the time when the hydraulic equipment was being operated the most – failures, all of which, that have replicated themselves **extensively** in the field subsequent to being shipped to New Orleans and installed at all three outfall canals…..

A vulnerability analysis should focus on identifying, and reducing the vulnerability of, the hydraulic pumping equipment components that pose the most danger of failure. The plethora of witnessed and documented hydraulic system failures occurring in the factory during testing were **not** suitably addressed and resurfaced in subsequent field test runs.

In fact, to give a clear example, during the 'suto' acceptance testing that was conducted in mid-late 2007, in a **one week** period **four (4)** of the small number of pump assemblies attempting the testing experienced **catastrophic failure**; O-Ring/Seal failure.

To give a broader example, during this same period time of ongoing acceptance testing, in just a six week period of time there were recorded five (5) pump assembly failures with associated O-Ring/Seal failure, five (5) failures due to Durst Drive overheating/not functioning properly/systems overheating, a Denison hydraulic pump failure, two (2) instances of hydraulic oil leaks (at a Denison pump, at a control panel) with a GOCM not able to shut down, and tow (2) instances where pump runs where vibrations/pulsating were recorded (even though the pump had a brand new pump assembly motor installed prior). Mind you this was after all pumps were deemed to have been cured of their vibration problems, all pump assemblies motors were retrofitted, and all pumping equipment was stated to the public to be ready for service in the even of a hurricane and in perfect health.

These unresolved failure/potentially catastrophic vulnerability issues that should be addressed are as follows:

- Acceptance testing. As this response will document, there has not been suitable/adequate/reasonable acceptance testing accomplished. Nor has there been acceptance testing done as reported by the PRS. The hydraulic pumping equipment has undergone numerous and varied system corrections/reconfigurations in attempts to mitigate some of the failure issues highlighted. Any attempt to state the hydraulic pumping equipment is now somehow suitable for its intended service must include an appraisal of the modified system with feedback to analysis the synthesis of information obtained

in any system evaluation. Two factors remain unaddressed here – the complete lack of acceptance testing as even described by the PSR as having occurred (and I would question the suitability of that on it's own even if it were done as reported), and, the complete lack of testing the mechanical integrity of any of the supposed corrective measures to the hydraulic pumping equipment taken to date.

- O-Ring/Seal failure issues. The first O-Ring failure was witnessed at the factory on April 18, 2006. Subsequent catastrophic pump assembly failures in the testing tank at the factory can also likely be attributed to this same phenomena. And, as already discussed above, there have been a plethora of pump assembly failures with associated O-Ring/Seal failures that occurred long after supposed corrective measures were taken. Obviously, these corrective measures did not work if such a large number of pump assemblies are still experiencing there same type of failures.
- Hydraulic system design deficiencies. There has been no attempt to address the hydraulic system design as inherently deficient – this must occur as it is the best means available to give some insight into the vast and numerous failure issues surrounding the hydraulic pumping equipment. In example, **the Durst drive chosen for the hydraulic pumping system appears to be inadequate.** The Cat Engine, rated 735 hp at 1800 rpm, has an output torques of **3218 lb ft** while the maximum input torque allowed by the Durst drive is **1995 lb ft**. This might give some insight as to the extensive problems seen in the field with regards to pump run failures due to overheating Durst drives....
- Gear Oil Circulation Motor/Durst Drive failure issues. This issue was deemed to have been addressed at the testing factory. As is discussed above, obviously this issue has not been addressed effectively.
- High pressure hydraulic pipe failure issues. The steel piping issue has yet to be addressed – all while the pipe remained unpainted, and, a contract to paint the piping called for sand blasting the pipe to remove the built-up rust – another issue that see's the effective pipe thickness get smaller, and smaller, when there was never any room to do so in the first place. An analysis is needed that takes into consideration the actual physical state of the high pressure hydraulic steel pipe.
- Excessive hydraulic system pressures and related hydraulic component failures. The hydraulic pumping equipment experiences what appears to be excessive internal hydraulic oil pressure related failures – this issue is likely ties to hydraulic system design deficiencies.

PSR: 3-1

Section 3 – Vulnerability Analysis

3.1 Purpose...

.....The scope and assumptions for the vulnerability analysis is as follows:

- The temporary pump stations are designed for a 5- to 7-year service life because they will be replaced with permanent pump stations by 2013.

It appears the PSR bases its analysis/assessments on a fundamentally faulty premise

A $530M project has a 5-7 year life span.....A $530M project that is to be abandoned in place and an almost identical (gated/permanent closure structure with installed pumps) project (cost of $800M) built a stones throw from the abandoned in place project (a few, at most, 100 yards further downstream)....Ok...I'm back in Iraq where the absurd is considered plausible again and very soon to become part of my new "reality"....

Our pumping equipment installed onto all three of the outfall closure structures was not meant to have, **nor does it have**, a 5-7 year life span. House Bills that have become subsequent Public Laws demonstrate this conclusively - public statements by the Commander of TFH also demonstrate this conclusively. Not to mention, our contract to procure these hydraulic pumps makes no mention as a "temporary" in nature status (5-7 year life span) of the hydraulic pumping equipment to be delivered, and, further specifically specifies the hydraulic pumping equipment supplied shall "conform with all requirements of the contract". Defining such conformance includes that the contract specifications even call for a specific requirement for a critical component of the hydraulic pumping system, the shaft bearing, "shall be designed for an L10 life of 50,000 hours" (L10 ≡ expected life of 90% of similar bearings) – for hydraulic pumping equipment designed to be utilized for hurricane protection this equates to a more than 50-year life span. In addition, the proposed project the PSR infers will replace our closure structures with installed pumps has not been signed into Public Law yet – this project is only in the planning phase, and, once Congress finally determines they have been mislead by USACE, that their original $530M project is now being abandoned in place and not considered in any of the future add-on projects (as required by Public Law 110-28), they will likely be rather upset.

I will discuss this issue in greater detail in Section 3.4 "Intended lifespan of Pumping Equipment Installed at the Three Closure Structures".

To give a very brief overview here of what constitutes the intended lifespan of our pumping equipment installed at all three outfall closure structures as defined by official government documents and public statements by the Commander of TFH:

PUBLIC LAW 109–234—JUNE 15, 2006. Provides the funds to build outfall canal closure structures and install pumps at 17th Street, London Avenue, and Orleans Avenue. Public Law 110-28. Specifically states:

"That the Secretary of the Army is directed to use the funds appropriated under this heading to..... provide hurricane and storm damage reduction and flood damage reduction in the greater New Orleans and surrounding areas; $530,000,000 shall be used to modify the 17th Street, Orleans Avenue, and London Avenue drainage canals and install pumps and closure structures at or near the lakefront;."

PUBLIC LAW 110–28—MAY 25, 2007. Provides the funds to investigate the technical advantages, disadvantages, and operational effectiveness of: (1) operating the new pumping stations at the mouths of the 17th Street, Orleans Avenue, and London Avenue canals (as authorized and direct for construction by Public Law 109-234 cited above) concurrently or in series with existing pumping stations serving these canals (SWB pump stations); (2) removing the existing pumping stations (SWB pump stations) and configuring the new pumping stations (adding capacity to the new closure structures at all three outfall canals) and associated canals to handle all needed discharges; and (3) replacing or improving the floodwalls and levees adjacent to the three outfall canals.

And, a very brief snip-it from one of Col Bedey's many public statements on the life span of the interim closure structures with installed pumps, recorded on **February 12, 2008**:

"....We have temporary closure structures at the 17trh St. Canal, Orleans and London. Those are interim,....Interim protection provides 100-year protection but not permanent nature protection. We have 100-year protection in place but we don't have permanent protection in place. These have something around a 50-year lifespan. These were designed to there for 50-years."

Bottom line, our closure structures with installed pumps were never meant to be anything less than industry standard type procurements with life spans similar, as defined by the contract, and, as defined by Public Law.

There is no project that has been signed into Public Law that defines our project any different. There is an attempt in process by USACE to abandon in place the existing $530M closure structures with installed pumps and build an almost identical project (gated/permanent closure structure with installed pumps) at a proposed cost of $800M a stones throw from the proposed abandoned structures (a few, at most, 100 yards further downstream)....however, as I stated previous, there is no formal authorization yet to abandon the newly built structures, and, Congress has not yet addressed USACE's apparent unresponsive Report to Congress where they did not study future follow-on projects that incorporate our newly built closure structures with installed pumps into the proposed project options.

Any analysis that attempts to shorten the lifespan of our hydraulic pumping equipment 10 fold is without any credibility.

PSR: 3-4 to 3-5

3.4 Component Vulnerabilities

3.4.1 Findings...

- **Unpainted hydraulic oil piping:**

  All

This analysis by the PSR is without standing. I know of no mathematical way to arrive at suitable numbers using ASME B31.3 process piping guide. Please refer to my first response to the DoDIG, "Response: Contract Issues – Allegation No. 13", pages 37-39.

In addition, there is no mention in the PSR what other considerations were made in the apparent "analysis" – missing would be some consideration for a significant additional loss of pipe thickness due to the ensuing sand blasting the hydraulic steel pipe is/was to undergo for subsequent painting. In addition, the environmental conditions the pipe has been subject to appear to have been glanced over – the pipe has been subject to a very harsh corrosive environment – installed directly over salty/brackish water for more than three (3) years.

Regardless, using Parsons ridiculously low value for corrosion would still yield our pipe is still unsuitable:

$$t_{min} = \frac{PD}{2\,(SE + PY)} \qquad (\text{for } t_{min} < D/6)$$

S = 16,000 psi — *Stress value for material* from Table A-1, Basic Allowable Stresses in Tension for Metals, ASTM B31.3 (16ksi for this temperature range)

E = 1.0 — *Quality factor* from Table A-1, Basic Allowable Stresses in Tension for Metals, ASTM B31.3 (seamless pipe)

D = 3.5" — *Outside diameter of pipe*

Y = 0.4 — *Coefficient* from Table 304.1.1 (valid for t < D/6) - temp < 900 ºF

Therefore, t_{min} = 0.3052326"

Add Corrosion Allowance (CA) as provided by Parsons:

$$t_{corr} = t_{min} + CA = 0.3052326" + 0.02" = \mathbf{0.325233"}$$

Adjust For Mill Tolerance:

$$t_{total} = t_{corr}/0.875 = 0.325233"/0.875 = \mathbf{0.3717"}$$

Determine the appropriate Pipe Schedule from table: for 0.3717" wall thickness, Schedule 160 = 0.438" wall thickness – our pipe is Schedule 80 = 0.300 "…**meaning, our Schedule 80 pipe is undersized.**

FYI, our steel pipe is from Spain – I decided to check the mill certs that came with the pipe, and, also decided to have our site piping contractor cut a random piece of pipe to check the mill tolerances. As I suspected, the pipe that is used in the construction of our hydraulic pipe physically exhibited the over and under pipe thicknesses specified by the mill certs, a +- 0.375".

Not only does ASME B31.3 require an adjustment for mill tolerance, but my own physical inspection of the pipe verified the hydraulic pipe exhibited areas of thickness less than 0.300" and down as far as 2.625".

PSR: 3-8

3.7 Pump Capacity Analysis

The design rainfall event serves as the basis of this analysis to determine the required and calculated pumping capacity for the 17th Street, London Avenue, and Orleans Avenue temporary pump stations. For the purpose of this report, this event is noted as the design rainfall event.

Again, the PSR bases its analysis/assessments on a fundamentally faulty premise.

The PSR uses a design rainfall event of 10-years. **This is improper**. Per USACE's own formal/official reports to Congress, and voluminous public statements, the interim closure structures with hydraulic pumps installed was designed to provide a 100-year level of protection – this is a level of protection equivalent to Hurricane Rita (comparing, Katrina was a 396 year storm).

Any and all "analysis" results the PSR provides are without merit as they are based on incorrect storm event levels. Interestingly, the 10-year rainfall event equates to the current capacity of the installed pumps at the closure structures (without additional rental pumps augmenting), so, obviously all conclusions in the pumping capacity analysis would be positive as to meeting pumping capacity needs – falsely positive however.

PSR: 3-10

3.8.1 Mechanical

All

Incredibly, the PSR omits from their vulnerability "analysis" a very important and significant component of the hydraulic pumping equipment system; the Durst drive.

And, interestingly, it turns out the Durst drive is severely undersized.

The pertinent installed and operational hydraulic pump components:

- Caterpillar 3412E DITTA rated 735 hp at 1800 rpm diesel engine

- Durst 2PD10 1:1 ratio Pump Drive

After a review of the spec sheets for the supplied Caterpillar diesel engine, Durst pump drive, and the Durst application sheet, it was determined the output torque of the Caterpillar diesel engine exceeds the maximum allowed input torque of the Durst pump drive.

Maximum input torque for the 2PD10 Durst pump drive is **1995 lb ft**. Output torque for the Caterpillar 3412E diesel engine is **2145 lb ft times a service factor**. The Caterpillar **service factor** is **1.5** as these units are designed to function as components in emergency pumping equipment operated during hurricane events and likely experience uniform loading – a direct hit hurricane event obviously last over 3 hours, and more likely far exceeds 10 hours.

As such, using a service factor of 1.5, the output torques from the Caterpillar diesel engine is **3218 lb ft** while the maximum input torque allowed by the Durst pump drive is **1995 lb ft**.

Of important note, as evidenced from historical hydraulic pump runs in the field (e.g. recorded SCADA data for outfall canal pump runs during Hurricane's Gustov and Ike) the hydraulic pumps spend the bulk of their time (more than ½) running at speeds of between 1250-1550 rpm, and the rest of the time at even lower speeds. This is important because the lower the prime mover speeds the higher the prime mover output torque - e.g. at 1400 rpm the Caterpillar output torque is 2511 lb ft, times a service factor of 1.5, the input torque the Durst pump drive sees is 3767 lb ft, or almost twice the maximum allowed.

In addition, as I have previously mentioned, there is extensive documentation that demonstrates there have been severe and extensive problems associated with Durst pump drives and GOCM's during subsequent field operations. Specifically, Quality Assurance (QA) reports from the short period of time during 'acceptance' testing (June-September 2007) indicates there were numerous failure issues/problems associated with the Durst pump drives and GOCM's. In addition, emails from USACE personnel in the field from this same time period speak to these Durst pump drive and GOCM failure issues, including calling the Durst drive problems as **"epidemic"** in nature – excerpts as follows:

Email sent on 03 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

```
Pump 3E had an oil circ pump problem, so we're back to running 2E at a reduced speed in
order to get 1E past the test.
```

Email sent on 03 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

```
Pump no 2W had a gear drive temp problem after 25 min, so we're shutting it down and
running 1W.
```

Email sent on 04 August 2007 from a USACE Construction Representative in the field to the TFH pump team stating:

Pump 2w failed after 1/2 hour because the gear oil in the Durst overheated.

...

Pump 3e failed because the gear oil in the Durst overheated.

Email sent on 05 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

Pump 4W had a Durst drive oil temp problem and only ran for half an hour. It also developed a small leak at a coupling on the platform at the PU.

Email sent on 05 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

We appear to have an epidemic of Durst drive oil circulation pump problems. We're shutting down the east pump test and moving to test two west pumps.

PSR: 3-14 to 3-16

3.9 Conclusions

All

As stated previous; all vulnerability analysis by the PSR is completely without credibility as it basis its conclusions on faulty premise – i.e. analysis based on a 5-7 year pumping equipment lifespan, and, a 10-year rain even.

In addition, as already described above, other findings were found as faulty for the other reasons stated herein.

It seems a ploy on the PSR's part to lower to bar to such a ridiculously low level in order to provide misleading and false conclusions of adequacy of the hydraulic pumping equipment in question.

PSR: 3-16 to 3-17

3.10 2008 Performance during Hurricanes Gustav and Ike

The Parsons team reviewed the Temporary Outflow Canal Pumps performance reports for the two hurricanes Gustav and Ike and gathered the following information:

3.10.1 Hurricane Gustav

All – including Table 3-10 and Table 3-11

3.10.2 Hurricane Ike

The information as presented in the PSR is misleading, incomplete, and also not factual.

All – including Table 3-12, Table 3-13, and Table 3-14

3.10.3 Conclusions

All

I have compiled the actual SCADA data for the pump runs during both hurricane events and will present additional/supplemental response with graphs and spreadsheets in Section 3.3 "Hydraulic Pump Runs During Hurricanes Gustav and Ike".

First, the PSR concludes this section with the statement they are confident that the hydraulic pumps will perform as designed and constructed to cope with the design rainfall event – because the PSR bases its analysis on a design rainfall event of 10-years, and not the correct design storm event of 100-yerards, the analysis and conclusions proffered have no standing/are without credibility.

My Pont-By-Point Response For Hurricane Gustav:

I have the following comments regarding the information presented in this section of the PSR:

- The hydraulic pump run times reported in the PSR are not factual.
- The individual hydraulic pump flow as reported in the PSR is not factual.
- The volume of flow reported for the hydraulic pumps as reported in the PSR is not factual.
- The canal levels as reported in the PRS are not factual.
- The PSR states the hydraulic pumps were mainly used to bring the canal levels down – this is not a truthful statement.
- Contrary to what is implied in the PSR, there was never any need to shut the gates and run the pumps – direct drive or hydraulic pumps.

The PSR reports that the hydraulic pumps were run a total of **105.3** pump hours at London Avenue – this is not true. The hydraulic pumps at hydraulic pumps at London Avenue were actually run a total of **92** hours.

The PSR reports that the hydraulic pumps were run a total of **224.5** pump hours at 17th Street (see pg 3-18) – this is not true. The hydraulic pumps at 17th Street were actually run a total of **58.5** hours. A review of Table 3-11 reveals the PSR total summation cell value for the individual hydraulic pumps is the place where a large portion of the incorrect value reported can be explained (total run time cell for each hydraulic pump reflects a summation error imbedded in the cell matrix for many pumps).

The PSR reports the individual hydraulic pump flow as full flow, 220 cfs, for each of the hydraulic pumps run – nothing could be further from the truth. This would imply each and every hydraulic pump was run at full (**100%**) operating pressures/speeds – **this**

never occurred. In fact, on average, each of the hydraulic pumps run during hurricane Gustav at London Avenue only ran at 3/5^{ths} (**60%**) operating pressures/speeds, and, on average, each of the hydraulic pumps run during hurricane Gustav at 17th Street only ran at 2/3^{rds} (**67%**) operating pressures/speeds.

The PSR reported volume of flow reported for the hydraulic pumps is not factual – as can already be deduced, such total flow calculations are a function of actual number of hours run and actual flow rate for the hydraulic pumps that were run.

The canal levels as reported in the PRS are not factual. It appears the PSR is not using canal levels as reported by the SCADA data. Actual canal water levels during all periods of pump operation will be provided in a reference document to be cited and discussed further in Section 3. 3 "Hydraulic Pump Runs During Hurricanes Gustav and Ike".

The PSR states the hydraulic pumps were mainly used to bring the canal levels down at London Avenue – this is not a truthful statement. Prior to the hydraulic pumps being operated the Direct Drive pumps were operated for 30 minutes and successfully dropped the canal water elevation 1' at London Avenue (4.34' to 3.38').

It was never necessary to shut the gates at 17th Street or London Avenue – if the gates had never been shut the safe water level at either outfall canal would never have been met or exceeded.

The safe water level at London Avenue is 5' – the highest the water level ever reached on the lake side of the closure structure was 4.76' (occurring during a period of time the gates were closed and the water level on the canal side of the closure structure was a corresponding 2.25').

The safe water level at 17th Street is 6' – by 9/1/08 20:50 the highest the water level ever reached on the lake side of the closure structure was 2.31' (occurring during a period of time the gates were closed and the water was allowed to build up to a corresponding 4.6' on the canal side of the closure structure – by 9/2/08 1:23 the highest water level, 2.5', on the lake side of the closure structure was recorded, and a corresponding water level of 2.12' was recorded for the canal side of the closure structure (pumping was occurring)).

Finally, the following is an email sent by Ms. Karen L Durham-Aguilera, Director, SES, P.E., Task Force Hope, to USACE upper command at MVD and Corps HQ. The email communicates forward a supposedly factual account of how the hydraulic pumps were utilized and functioned during Hurricane Gustov. This email was sent sometime during 09/02/2008 and reads as follows:

Subject: Successful outfall canal and pump operations (UNCLASSIFIED)

```
Classification:  UNCLASSIFIED
Caveats: NONE

 Sir and all, just a quick note to let you know: of news we are very
happy to relay.from the team.
```

Re: the outfall canals and pump stations:

Last night, with the rising water levels in the outfall canals, in accordance with our protocols. we closed the gates and operated the pumps at London Ave and 17 St Outfall Canals. Gates were successfully lowered and locked into position and the pumps were operated. The pump units have worked perfectly so far.

At least four units at London ran from 1900 last night until 0700 this morning. All of them ran most of the night.

17th St Canal was operated from 2100 to 0700 this morning, One group of six hydraulic pumps, 1-6 E at 17th ran continuously from 2100 hours last night until 0700 this morning (10 hours) without incident. We are now turning pumps on and off to pump when the city pumps.

At both Canal stations, water in the canal was lowered to 2' elevation within about 45 min, pumps worked so well that we had to reduce the number running so as to not exceed the parish's capacity so they could continue to operate their pumping stations. Meaning the pumps worked effectively and efficiently as they were designed to do.

Orleans Canal did not require operation.

Harvey Sector Gate was closed Sunday morning o/a 0330 hrs; no pumping operation required.

More details later. Fyi JFO without power for over 3 hrs, limiting operations here.

Classification: UNCLASSIFIED
Caveats: NONE

This email represents false and misleading reporting forward by high level Commanders in the field, and, continues what is a culture of reporting forward factually incorrect and/or over reaching statements of facts surrounding the operational utilization and functionality of the hydraulic pumps – false characterizations that lend support to and help validate the falsely reported tested and touted as fully operational per contract status of said pumps.

My rebuttal to the unfactual content of this email is as follows:

1) Belying the implied need expressed in the cited email, Hurricane Gustav posed little to no threat to the City of New Orleans, and, water levels in all three outfall canals was such that only minimal pumping was possible. The facts, and SACDA data, show storm surge as experienced at the gated closure structures **never** reached or exceeded the Safe Water Level (SWL) - had the gates never been closed for this event there would have been **no** adverse affect to the city of New Orleans from flooding
2) Belying an implied utilization status, through message structure and constructed omission, not one single hydraulic pump was operated to initial bring canal water levels down at both outfall canals – <u>not</u> <u>one</u>. <u>Only</u> Direct Drive pumps were initiated and operated when it was necessary to start to pump and maintain safe

water levels in both outfall canals. Only after the water level was significantly reduced at London Ave. outfall canal (4.3-3.3'), and the Direct Drives proved themselves to be capable and efficient (1' drop in 30 min.), were hydraulic pumps then operated. And, only after the Direct Drive pumps were operated at 17th Street on two separate occasions over a 5.5 hr period were the hydraulic pumps then operated.

3) Contrary to the message relayed forward by the cited email not one single hydraulic pump operated at its design capacity/flow rate (full operating speeds/pressures to meet design flow capacity).
4) Contrary to the overall intent of the message relayed forward by the cited email Hydraulic pump run periods, times, and operating speeds/pressures as documented were not examples of pumps being pressed into emergency pumping service and operated at full design capacity – they were nothing but 'exercise'/'demonstration' pump runs that proved nothing as to the functionality and operability of these hydraulic pumps. These reduced pump run periods, times, and operating speeds/pressures are also the remedy that was be used to keep failing and in the process of failing hydraulic pumps running significantly longer before ultimate failure – a remedy known to TFH and NOD.
5) Contrary to the message relayed forward by the cited email, the 4 hydraulic pumps cited at London Ave. outfall canal did not operate for a 12 hour duration during the night – the most any hydraulic pump ran were WP03, WP05 and WP06 which ran for 7.5 hours at ¾ or less operating speeds/pressures.
6) Contrary to the message relayed forward by the cited email all the hydraulic pumps at London Ave. outfall canal did not run most of the night.
7) Contrary to the message relayed forward by the cited email the 6 hydraulic pumps cited at 17th Street (1-6E) did not run continuously for 10 hours from 2100 hrs to 0700 hrs - they ran intermittently for a total of 7.5 hrs at significantly reduced operating speeds/pressures.
8) A hero in size omission not honestly communicated forward by the cited email is that TFH and NOD did not have good faith the hydraulic pumps would operate as required. This is evidenced by the nature of how the hydraulic pumps were operated - by executing exercise/demonstration level pump runs (coupled with their full knowledge failing and in the process of failing hydraulic pumps will stay operational longer by running them at reduced speeds/pressures), including, not operating a single hydraulic pump to initially bring canal water levels down at both outfall canals. Only Direct Drive pumps were initiated and operated when it was necessary to start to pump and maintain safe water levels in both outfall canals, and only when the Direct Drives were shown to be successful were hydraulic pumps then utilized. In addition, TFH & NOD had the opportunity to finally be able to run more than one or two hydraulic pumps at design level conditions (full operating speeds/pressures) for more extended periods of time – something they were previously unable to do due to previously insufficient canal water levels (due to the Corps pump-on elevation design flaw). They purposely chose to not do this…

My Pont-By-Point Response For Hurricane Ike:

I have the following comments regarding the information presented in this section of the PSR:

- The hydraulic pump run times reported in the PSR are not entirely factual.
- The Direct Drive pump run time reported in the PSR for 17th Street is not factual.
- The individual hydraulic pump flow as reported in the PSR is not factual.
- The volume of flow reported for the hydraulic pumps is not factual.
- The PSR states the hydraulic pumps were run intermittently over two days at 17th Street outfall canal – this is a gross misleading statement.
- The PSR strongly implies the hydraulic pumps were responsible for maintaining a safe water level at London Avenue outfall canal - this a misleading and untruthful statement.

The PSR reports that the hydraulic pumps were run a total of **28.6** pump hours at 17th Street – this is not entirely factual. The hydraulic pumps at 17th Street were actually run a total of **24** hours. A review of hydraulic pump runs for London Avenue indicated the PSR reported value and my calculated value were relatively similar (15.93 vs 16.25 hours respectively).

The PSR reports that the direct drive pumps were run a total of **76.4** pump hours at 17th Street – this is not true. The direct drive pumps at 17th Street were actually run a total of **12.3** hours.

The PSR reports the individual hydraulic pump flow as full flow, 220 cfs, for each of the hydraulic pumps run – nothing could be further from the truth. This would imply each and every hydraulic pump was run at full (**100%**) operating pressures/speeds – this never occurred. In fact, on average, each of the hydraulic pumps run during hurricane Ike at London Avenue only ran at 3/5ths (**60%**) operating pressures/speeds, and, on average, each of the hydraulic pumps run during hurricane Ike at 17th Street only ran at 3/4ths (**75%**) operating pressures/speeds.

The PSR reported volume of flow reported for the hydraulic pumps is not factual – as can already be deduced, such total flow calculations are a function of actual number of hours run and actual flow rate for the hydraulic pumps that were run.

The PSR states the hydraulic pumps were run intermittently over two days at 17th Street outfall canal – this is a gross misleading statement. In fact, on average, for each hydraulic pump run at 17th Street, 11 in total (not the six reported in the PSR) they only operated an average of only a total 2.2 hours at 75% operating pressures/speeds. If run "intermittently" over a two day period this would result in an average run time of 2 ¾ minutes every hour.

The PSR strongly implies the hydraulic pumps were responsible for maintaining a safe water level at London Avenue outfall canal – nothing could be further from the truth. Of

important note, hydraulic pumps were never run to initially bring down canal water levels – only direct drive pumps were ever used to initially bring down canal water elevations. Hydraulic pumps were used intermittently, run at reduced pressures/speeds, and were only run a total of 16.25 hours – for the 9 hydraulic pumps run at London Avenue that resulted in an average run time of just over 1 ¾ hours each at 60% operating pressures/speeds. In contract, direct drives were run at London Avenue a total of 50.25 hours resulting in an average run time of over 6 ¼ hours each. Therefore, for the limited pumping required at London Avenue, direct drive pumps were run 3.5 times more than the hydraulic pumps which were run at severely reduced operating pressures/speeds.

SECTION 3 – Additional/Supplemental Rebuttal to the PSR

Section 3.1 – Lack of Credible/Factual Acceptance Testing

Recapping what has been discussed prior:

Nothing as reported in the PSR is truthful.

The DoDIG states "The final acceptance tests for each hydraulic pumping system were conducted in the field by the contractor with oversight by USACE. USACE documented the tests with quality assurance reports (QARs) which recorded the testing parameters including pump speeds, run times, temperature, and deviations from test procedures."

The PSR states "acceptance tests for each complete system included running at least 2 hours at an engine speed of 1,800 rpm and a hydraulic pressure of 3,200 psi. Steady-state conditions, engine rpm, engine jacket temperature, hydraulic system oil pressure and temperature, leakage (required: none), and canal level were monitored. These tests were conducted on each hydraulic pumping system by the contractor with oversight by USACE. USACE documented any deviations from the testing parameters including pump speeds, run times and temperatures."

However, a comprehensive review of the official USACE QA Reports for all the acceptance testing conducted demonstrates the following represents what are actual truthful statements:

- **None** of the hydraulic pumps undergoing field acceptance testing ran at least 2 hours at an engine speed of 1,800 rpm and a hydraulic pressure of 3,200 psi.
- **None** of the hydraulic pumps undergoing field acceptance testing had their steady-state conditions recorded – i.e.; engine rpm, engine jacket temperature, hydraulic system oil pressure and temperature, leakage (required: none), and canal level were monitored.
- USACE did **not** document any deviations from the testing parameters including pump speeds, run times and temperatures.
- The documentation did **not** show all abnormalities previously identified in the pump manufacture and installations were corrected prior to the acceptance tests – in fact documentation shows numerous pumps experienced subsequent catastrophic failures after supposedly passing stated acceptance testing.
- All significant abnormalities were **not** corrected by September.

The acceptance testing the PSR contends happened in actual fact **never** took place. The acceptance testing data, as recorded by USACE Task Force Hope Quality Assurance (QA) personnel, shows that **none** of the hydraulic pumps were run at the official contractually agreed to (required) Acceptance Testing Procedures, and, **none** of the hydraulic pumping equipment system operating parameters were recorded as contractually required (time/pressure/speed/oil temp/water temp/canal level/leaks/ambient conditions). In fact, these official USACE Quality Assurance QA records for the Acceptance Testing cited in the PSR **prove** the assertions made in the PSR are false.

Incredibly, on the dates the hydraulic pump acceptance testing was reported as completed successfully, "passed" (as reported to, and by, the GAO, DoDIG and Parsons), the actual data recorded and reported by USACE QA field personnel for these same hydraulic pumps show the following was actually **officially** recorded for the 40 hydraulic pumps cited:

- **8** of the 40 hydraulic pumps with no testing data recorded even though QA personnel were on site (at the outfall canal closure structures in question) and recording other work ongoing.
- **2** of the 40 hydraulic pumps with no record of any testing done at all.
- **12** of the 40 hydraulic pumps recorded as "ran" with no other testing data recorded (time/pressure/speed/oil temp/water temp/canal level/conditions/leaks).

- **7** of the 40 hydraulic pumps recorded as running 2 hours with no other testing data recorded.
- **5** of the 40 hydraulic pumps recorded as running 1.5 hours at with no other testing data recorded.
- **1** of the 40 hydraulic pumps recorded as running 2 hours at reduced speed/pressure and no other testing data recorded.
- **3** of the 40 hydraulic pumps recorded as failing the acceptance testing due to Durst Drive failures on the very day cited as "passing" same. A couple weeks later one of the pumps reported as "ran" for 2 hours with no other testing data recorded, another pump was retested and recorded as "passed" yet recorded hydraulic oil leaks and a GOCM that was not functioning properly, and no retest recorded for the other pump.
- **1** of the 40 hydraulic pumps recorded as failing the acceptance testing due to an O-Ring failure on the very day cited as "passing" same with no retest recorded as completed.
- **1** of the 40 hydraulic pumps recorded as failing the acceptance testing as it was in the by-pass mode – a couple weeks later recorded as retested and "passed" with no other testing data recorded.

In addition, QA recorded data shows in the few days after certain **handful** of hydraulic pumps supposedly "passed" acceptance testing some were used again to assist with helping achieve 'prime' for other neighboring pumps still needing to undergo acceptance testing – **3** of these hydraulic pumps experienced catastrophic hydraulic pump failures; two experienced O-Ring failures and one experienced a seal failure. Of important note, no other subsequent acceptance retesting data is recorded for any of these hydraulic pumps.

Also of important note, rainfall events as recorded by NOAA for the drainage basin associated with the three outfall canals for the entire acceptance testing period, provide physical evidence that pump acceptance testing runs, as cited in the PSR, were not possible (not enough water in the canals to run the hydraulic pumps as cited). It appears Parson has relied (like GAO and DoDIG?) on summary/executive summary/chronology documents given to them by New Orleans District (NOD) USACE Task Force Hope (TFH) instead of delving through the piles (and piles) of raw data.

Also troubling, reviewing the USACE acceptance testing documentation for each hydraulic pump, in conjunction with the vibration analysis that was done for a plethora of hydraulic pumps, along with related USACE QA reports, yields some very disturbing realities – as follows:

- In the Jan.-Mar., 2007 timeframe, all 40 hydraulic pumps were retrofitted with stronger/more robust rebuilt Rineer motors, and proclaimed by USACE TFH to have been successfully tested and ready for service during hurricane season if needed. These same hydraulic pumps are subsequently run (in a limited fashion) and experienced what can be characterized as catastrophic failures if occurred during a Hurricane event; i.e. O-Ring/Seal failures, hydraulic component failures, Durst Drive/Gear Oil Circulation Motors overheating, severe vibrations/pulsations during runs, and failure requiring replacement of the Rineer motor. Even with the limited USACE documentation available, still able to document **15 of the 40** hydraulic pumps in this category (and some with multiple failures).
- In the Mar. 2007 time frame, numerous hydraulic pumps undergo vibration analysis (13) and reported as concluding with positive/successful results. These same hydraulic pumps are subsequently run, in a limited fashion, with numerous pumps experiencing what can only be characterized as catastrophic failures; i.e. O-Ring/Seal failures, Durst pump drive not working properly, and hydraulic system close to overheating – there are even recorded pump runs where severe vibrations/pulsations are recorded. Again, even with the limited USACE documentation available still able to document **5 of the 13** hydraulic pumps in this category (and one with multiple failures).
- In the Jun. – Sept. 2007 timeframe, all the hydraulic pumps undergo acceptance testing and are reported as "passing", testing being successfully accomplished. These same hydraulic pumps are run on the day of passing acceptance testing to only a couple weeks subsequent, with numerous pumps reported as experiencing what can only be characterized as catastrophic failures; O-Ring/Seal failures, Durst Drive/Gear Oil Circulation Motors overheating, severe

vibrations/pulsations during runs, etc.. Again, even with the limited USACE documentation available still able to document **8 of the 40** hydraulic pumps in this category.

The findings as presented in the PSR have no standing – they are baseless as evidenced by a complete lack truthful evidence to rely on. Simply parroting what is presented in a summary report produced by the very persons that have served to mislead and dissuade further investigation into the defective pumping equipment is insufficient. The PSR states, and the original DoDIG report also states, USACE documented the acceptance tests for all 40 hydraulic pumps with quality assurance reports (QARs) which recorded the testing parameters, including pump speeds, run times, temperature, and deviations from any of the test procedures. If only the PSR addressed these actual QA reports maybe we would not continue to delve down the same corridors of deception and misinformation. A review of the actual USACE QA reports for all acceptance testing provide a much different picture of the actual acceptance testing accomplished, or better yet, not accomplished.

The nature and content of the official USACE hydraulic pump acceptance testing data, the nature an content of the official USACE summary/executive summary/chronology documents given to various federal investigatory agencies in the course of the various investigations, and the obvious efforts to promote false/untrue contentions in order to avert further questions regarding the operability/suitability of the hydraulic pumping equipment, is such it gives rise to serious questions about malfeasance.

The need for real/viable acceptance testing is still critical, it's imperative to insure the safety and welfare of the citizens of New Orleans. Without it there is no means to ensure the hydraulic pumps will function as they are required to by contract and design – that is, survive being operated at full operating pressures/speeds (to provide as close to the minimum required flow rate) during the design storm event (apparently, per the PSR, a 10-year, 24 hour rainfall event – not the design 100-year storm event reported to Congress and the public).

Additional/Supplemental Acceptance Testing Information.

The PSR makes the false finding that the hydraulic pumping equipment failures ("anomalies") were corrected and proven such by the acceptance testing documentation ("correction and retesting ...administered until the witnessed anomalies are eliminated and there are no other anomalies experienced") – as already provided in great detail in previous documentation, **nothing could be further from the truth**. In order to better 'see' the individual plethora of failure issues, recorded testing accomplished, and actual timeline involved showing an apparent lack of suitably functioning hydraulic pumping equipment, the following is provided:

Historical Hydraulic Pumping Equipment Data/Information/Field Testing For All Hydraulic Pumps At All Three Outfall Canals (17th St., London Ave., and Orleans Ave.) For January - September 2007 Timeframe Only (after all hydraulic pumps retrofitted up to end of 'acceptance testing').

The following chronology of historical hydraulic pump data, as reported by USACE, or recorded by USACE, is compiled from the following available hydraulic pumping equipment data for all hydraulic pumps at all three outfall canals

- USACE reported date for successful Acceptance Testing (AT), as reported to the GAO, DoDIG and Parsons – will be annotated with yellow.

- USACE reported **field vibration testing** done by company contracted to perform this task, Measurements, LLC, also will be annotated with yellow.
- Additional hydraulic pumping equipment data as supplied to the GAO and DoDIG by USACE - including "Outfall Canal Chronology 8 Nov 07", "Pump Acceptance List", and "Executive Summary for GAO". Sever and/or catastrophic failure issues will be annotated in red. Minor failure issues (would likely not disable the hydraulic pump) will be annotated in grey.
- All USACE recorded **Quality Assurance (QA) Reports** for the period during Acceptance Testing. Severe and/or catastrophic failure issues will be annotated in red. Minor failure issues (would likely not disable the hydraulic pump) will be annotated in grey.

17th street Outfall Canal West Side Hydraulic Pumps

17th - 1W

01/24/2007	Pull Pump - install new springs
03/23/2007	Install Pump
03/24/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran approximately one hour at full operating pressure.
09/04/2007	Cited as "passed" AT. However, per QA Reports: Per QA JD: ran pump for one hr at 1800 rpm and one hr at 1400 rpm (no other testing data recorded). Per QA JPB: ran pump for 1 hr at 3100 psi/1803 rpm and one hour at 2400 psi/1400 rpm (no other testing data recorded).

17th - 2W

01/24/2007	Pull Pump - install new springs
03/24/2007	Pump run - QA on site reported pump ran approximately 20 min at between 75-80% operating pressures before **emergency shutdown – high pressure hydraulic hose failed.**
03/31/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 15 min at 2/3 operating pressure and another 15 min at 95% operating pressure.
08/24/2007	**Pull Leaking Pump - rope @ shaft**
08/26/2007	Cited as "Passed" AT. However, per QA Report: Pump ran for 2 hr - no other testing data recorded.
09/04/2007	Ran pump for one hr at 1800 rpm and one hr at 1400 rpm and, **this unit was pulsating** (no other testing data was recorded). Per QA JPB: Ran pump for one hr at 2700psi/1800 rpm - water elevation at 1.5 and pump then ran approx. one hr at 2200 psi/1400 rpm. **Pump experiencing vibrations during run (in high pressure hose on case drain side). This pump has a new Rineer motor installed (SN 200708266).** No other testing data was recorded.

09/10/2007	Per QA's: Ran pump test yet no other pump run data recorded save **vibration present in pump during run (reported as in the high pressure line on the case drain side)**.

17th - 3W

01/24/2007	Pull Pump - install new springs
03/22/2007	Install Pump
03/24/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran just over one hour at full operating pressure.
09/10/2007	Cited as "passed" AT – However, per QA Report: Recorded as ran pump test, yet no other testing data recorded save **O-Ring reported as leaking** and was changed out by the KTR .

17th - 4W

01/24/2007	Pull Pump - install new springs
03/16/2007	Install Pump
03/17/2007	Pump ran – The Pump Team Leader, with QA and NOLA Operations personnel also present, reported the **pump experienced a Denison hydraulic pump failure.** The hydraulic pump was replaced and the pump run was resumed – pump ran 50 min at full operating pressure.
03/24/2007	Pump tested for vibration. The Company contracted to perform this task, Measurements, LLC, reported the motor and pump had acceptable levels of vibration. QA on site reported pump ran over 1.5 hours at close to full operating pressure.
09/10/2007	Cited as "passed" AT – However, per QA Report: Recorded as ran pump test, yet no other testing data recorded save **Durst motor did not work properly.**

17th - 5W

01/25/2007	Pull Pump - install new springs
03/22/2007	Install Pump
03/24/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran approximately 50 min at a bit over 90% operating pressure before pump shut down due to "minor" oil leak at pump.
08/24/2007	**Pull Leaking Pump - leaking at seal**
08/25/2007	Install Pump
09/10/2007	Cited as "passed" AT – However, per QA Report: Recorded that ran pump test yet no testing data recorded.

17th - 6W

01/25/2007	Pull Pump - install new springs
03/16/2007	Install Pump

03/17/2007	Run Pump – The Pump Team Leader, with QA and NOLA Operations personnel also present, reported the pump ran 50 min at full operating pressure.
03/24/2007	Pump tested for vibration. The Company contracted to perform this task, Measurements, LLC, reported the pump had vibration issues – believed to be caused by an imbalance in the impeller (caused by either damage to the impeller or material caught on the impeller). Recommended this pump should be retested. QA on site reported pump ran a bit over two at full operating pressure.
09/10/2007	Cited as "passed" AT – However, per QA Report: Recorded that ran pump test yet no testing data recorded.

17th - 7W

03/2/2007	Install Pump
03/10/07	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pulsation or excessive vibration or noise were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 1.5 hours at almost full operating pressures.
03/24/2007	Pump tested for vibration. The Company contracted to perform this task, Measurements, LLC, reported the motor and pump had acceptable levels of vibration. QA on site reported pump ran 45 min at full operating pressure.
08/24/2007	Cited as "passed" AT – However, per QA Report: Pump ran for 1.5 hr - no other testing data recorded.
09/13/2007 or 09/14/2007	Reported ran pump (for one hr) till ran out of water - heat sensor installed on unit. No other run data recorded

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17th - 8W

03/5/2007	Install Pump
03/10/07	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pulsation or excessive vibration or noise were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 1.5 hours at almost full operating pressures.
03/24/2007	Pump tested for vibration. The Company contracted to perform this task, Measurements, LLC, reported the motor and pump had acceptable levels of vibration. QA on site reported pump ran 75 min at full operating pressure.
09/13/2007 or 09/14/2007	Ran pump (for one hr) till ran out of water - no other run data recorded. Email from RE stated Pump ran for 1 hr @ 3200 psi and **pump close to overheating during run**.
09/15/2007	Cited as "passed" AT – However, per QA Report: Recorded that ran pump test yet no testing data recorded.

17th - 9W

03/5/2007	Install Pump

03/10/07	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pulsation or excessive vibration or noise were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 1.5 hours at almost full operating pressures.
09/14/2007	Cited as "passed" AT – However, both QA's (JPB & JD) at site and filed QA reports yet no documentation of any testing done for this unit. In addition, one QA even documents/reports heat sensor installed on neighboring unit 7W.

17th - 10W

03/5/2007	Install Pump
03/10/07	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pulsation or excessive vibration or noise were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 1.5 hours at full operating pressures.
09/14/2007	Cited as "passed" AT – However, both QA's (JPB & JD) at site and filed QA reports yet no documentation of any testing done for this unit. In addition, one QA even documents/reports heat sensor installed on neighboring unit 7W.

17th street Outfall Canal East Side Hydraulic Pumps

17th - 1E

01/31/2007	Pull Pump - install new springs
03/26-29/07	Install Pump
03/31/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran 15 min at 70-75% operating pressure, 15 min at 95% operating pressure., and about 10 min at ¾ operating pressure.
09/07/2007	Cited as "passed" AT – However, per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any testing data. Per RE email: Ran pump test for pumps 1-6E.

17th - 2E

01/31/2007	Pull Pump - install new springs
03/26-29/07	Install Pump
03/31//2007	QA on site reported pump ran approximately 30 min at operating pressures between 2500-3200 psi.
09/07/2007	Cited as "passed" AT – However, per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any testing data. Per RE email: Ran pump test for pumps 1-6E.

17th - 3E

01/31/2007	Pull Pump - install new springs
03/26-29/07	Install Pump
03/31/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran approximately 30 min at operating pressure between 2400-3200 psi.
08/26/2007	Cited as "passed" AT – However, per QA Reports: Per QA JD: Pump ran for 1.5 hr - no other testing data recorded. Per QA JPB: Pump ran 2 hr at 1400 rpm - no other testing data recorded.
09/07/2007	Recorded ran pump, however, no pump run data recorded. Per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any other run/test data recorded. Per RE email: Ran pump test for pumps 1-6E.

17th - 4E

01/31/2007	Pull Pump - install new springs
04/02/2007	Install Pump
04/06(5)/2007	Run Pump - Run Pump – QA on site reported pump ran a bit over 30 min at full operating pressure.
09/07/2007	Cited as "passed" AT – However, per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any testing data. Per RE email: Ran pump test for pumps 1-6E.

17th - 5E

01/31/2007	Pull Pump - install new springs
03/26-29/07	Install Pump
03/31/2007	Pump tested for vibration and for pressure pulsation in the hydraulic lines. The Company contracted to perform this task, Measurements, LLC, reported no pressure pulsations were detected on the motor and pump had acceptable levels of vibration. QA on site reported pump ran approximately 40 min at operating pressure between 1500-3200 psi.
09/07/2007	Cited as "passed" AT – However, per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any testing data. Per RE email: Ran pump test for pumps 1-6E.

17th - 6E

01/31/2007	Pull Pump - install new springs
04/02/2007	Install Pump
04/6(5)/2007	Run Pump – QA on site reported pump ran 40 min at almost 90% operating pressure.
09/07/2007	Cited as "passed" AT – However, per QA Report: "lower gates...tested 6-pumps on the east side..." - no pump No's or any testing data. Per RE email: Ran pump test for pumps 1-6E.

17th - 7E

03/16/2007	Install Pump

03/17/2007	Pump ran - The Pump Team Leader, with QA and NOLA Operations personnel also present, reported the pump ran 55 min at full operating pressure.
08/24/2007	**Pull Leaking Pump - pipe leak**
08/25/2007	Install Pump
08/26/2007	Cited as "Passed" AT. However, per QA Report: Pump ran for 1.5 hr - no other testing data recorded.

17th - 8E

03/17/2007	Install Pump
03/17/2007	Pump ran - The Pump Team Leader, with QA and NOLA Operations personnel also present, reported the pump ran 55 min at full operating pressure.
09/15/2007	Cited as "passed" AT – However, per QA Report: Pump recorded as being run, however, no testing data was recorded.

London Avenue Outfall Canal West Side Hydraulic Pumps

London - 1W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Run Pump - QA on site reported pump ran 5 min at almost full operating pressure.
08/03/2007	Cited as "passed" AT – However, per QA Report: Pump recorded as being run, however, no testing data was recorded.

London - 2W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Run Pump - QA on site reported pump ran approximately 10 min at 75% operating pressure.
08/03/2007	Cited as "passed" AT – However, per QA Report: **Pump could not achieve operating pressure of 3000 psi** – no other testing data recorded. And, per RE email there was an attempt to run this pump but after approx 1/2 an hour **pump run aborted due to gear drive temperature problem**. Per additional NOLA Field personnel email: **Pump reported as failing after 1/2 hour of testing due to gear oil in the Durst drive overheating**.
8/16/2007	Per QA reports (both QA's), pump reported as run for two hours, however, no run/test data was recorded.

London - 3W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Per QA on site, could not run pump as Durst drive oil too low (2 quarts).
05/03/2007	Pump ran - QA on site reported pump ran almost 15 min at between 500-3200 psi (15-100% operating pressure).

08/03/2007	Cited as "passed" AT – However, per QA Report: Pump reported completing two hour test, however, no other testing data was recorded.
8/16/2007	Per QA report pump run to help prime 2-W and 4W – however, no pump run data was recorded save a hydraulic oil leak at Denison pump flange and an engine oil leak by starter.

London - 4W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Run Pump - QA on site reported pump ran approximately one hour at almost full operating pressure.
08/05/2007	Cited as "passed" AT – However, per QA Report: Pump run for test but **test failed after 35 min due to oil cooler motor not functioning**. Also, hydraulic oil leak at the snap tight fitting. Per RE email: **pump shut down due to Durst drive oil temp problem**.
8/16/2007	Per QA reports pump run for two hours yet no other data recorded save there was a hydraulic leak in panel and the GOCM would not shut down.

London- 5W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Run Pump - QA on site reported pump ran approximately 45 min at almost full operating pressure.
07/26/2007	Cited as "passed" AT – However, both QA's on site yet no data recorded for any pump runs including this pump.
08/05/2007	Per QA report pump run to assist with priming 4-W, yet no run data recorded.
08/16/2007	Per QA report pump ran to help prime 2-W and 4W – yet no run data recorded.

London- 6W

03/15/2007	Pull Pump - Install new springs
04/17-18/2007	Install Pump
04/19/2007	Run Pump - QA on site reported pump ran approximately 30 min at almost full operating pressure.
07/26/2007	Cited as "passed" AT – However, both QA's on site yet no data recorded for any pump runs including this pump.

London Avenue Outfall Canal East Side Hydraulic Pumps

London - 1E

03/03/2007	Pull Pump - Install new springs
05/01-02/2007	Install Pump
05/03/2007	Pump ran - QA on site reported pump ran almost 10 min at between 70-90% operating pressure.
08/03/2007	Per QA on site nothing recorded for this pump even though recorded pump runs for other on site pumps. Per RE email there was an attempt

to run this pump but no result reported. Per other NOLA field personnel, pump "passed" yet no other data/info provided…

08/07/2007 Cited as "passed" AT – However, per QA Report: Pump reported as ran for two hours - no other testing data recorded.

London - 2E

03/03/2007 Pull Pump - Install new springs

05/01-02/2007 Install Pump

05/03/2007 Pump ran - QA on site reported pump ran almost 15 min at between 70-90% operating pressure.

08/03/2007 Per QA JD: **Pump was run and was incapable of reaching 3000 psi.** Per RE email: Pump run at "reduced speed in order to get 1E past test". Also Per RE. email : **2E had "hydraulic oil pressure problem" t**hat precluded it from running with 1E & 3E. Per additional NOLA Field personnel email: **Pump reported as failing testing due to a sudden drop in hyd. Oil pressure (to 2400 psi) (likely "a Denison fail**

08/07/2007 Cited as "passed" AT – However, per QA JPB: Pump run for 2 hours - no other testing data recorded. Per QA JD: fixed by-pass and run pump for 2 hrs - no other testing data recorded

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London - 3E

03/03/2007 Pull Pump - Install new springs

05/01-02/2007 Install Pump

05/03/2007 Pump ran - QA on site reported pump ran 10 min at almost full operating pressure.

08/03/2007 Per QA on site nothing recorded for this pump even though recorded pump runs for other on site pumps. Per RE email **there was an attempt to run this pump but run aborted as pump experienced an oil circulation problem**. Per additional NOLA Field personnel email: **Pump reported as failing testing due to gear oil in the Durst drive overheating**

08/07/2007 Cited as "passed" AT – However, per QA report: Pump run for 2 hours - no other testing data recorded

Per QA JPB: Pump run for 2 hours - no other run data recorded. Per QA JD: nothing for this pump recorded (even though pump next to it was recorded as being tested (2-E). Per RE email: lowered gates, pump passed 2 hr acceptance test.

London - 4E

03/03/2007 Pull Pump - Install new springs

05/01-02/2007 Install Pump

05/03/2007 Pump ran - QA on site reported pump ran almost 50 min at between 70-95% operating pressure.

08/05/2007 Cited as "passed" AT – However, per QA report: Pump run for 2 hours - no other testing data recorded

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London - 5E

03/03/2007	Pull Pump - Install new springs
05/01-02/2007	Install Pump
05/03/2007	Pump ran - QA on site reported pump ran 45 min at between 70-95% operating pressure.
08/05/2007	Cited as "passed" AT – However, per QA report: Hydraulic system would not pump – the hydraulics stayed in the by-pass mode. L-6E was started to take over L-5E's place. However, QA report goes on to state L-5E passed the 2 hour test.
08/07/2007	Per QA report pump run and **oil cooler not functioning - thermostat replaced.**
08/17/2007	Per QA reports pump tested for 2 hours, yet no testing data recorded.

London - 6E

03/03/2007	Pull Pump - Install new springs
05/01-02/2007	Install Pump
05/03/2007	Pump ran - QA on site reported pump ran almost 15 min at 75% operating pressure – QA reported **hydraulic too low, starter kept engaging, engine won't rev, idle problem**.
08/05/2007	Cited as "passed" AT – However, per QA report: This pump was started to take over L-5E's place because L-5E would not pump. No testing data was recorded for this pump.
08/17/2007	Per QA report pump run to provide prime for 5E but no run data recorded.

Orleans Avenue Outfall Canal West Side Hydraulic Pumps

Orleans - 1W

03/22/2007	Pull Pump - Install new springs
05/16/2007	Install Pump
05/31/2007	Run Pump
07/05/2007	Cited as "passed" AT – However, per QA report: pump test was run for 1.5 hours until water level was too low – no other pump testing data was recorded.

Orleans - 2W

03/22/2007	Pull Pump - Install new springs
05/21-23/2007	Install Pump
05/31/2007	Run Pump
08/17/2007	**Per QA pump pulled due to mechanical seal leaking.**
08/22/2007	Cited as "passed" AT – However, no QA reports to view.

Orleans - 3W

03/22/2007	Pull Pump - Install new springs
05/21-23/2007	Install Pump
05/31/2007	Run Pump
08/22/2007	Cited as "passed" AT – However, no QA reports to view.

Orleans - 4W

03/21/2007	Pull Pump - Install new springs
05/25/2007	**Pump pulled – Rineer motor replaced.**
05/30/2007	Install Pump
05/31/2007	Run Pump
06/27/2007	Cited as "passed" AT – However, per QA report: pump reported as "passed" pump test yet no testing data recorded.

Orleans - 5W

03/21/2007	Pull Pump - Install new springs
05/21-23/2007	Install Pump
05/31/2007	Run Pump
06/27/2007	Cited as "passed" AT – However, per QA report: pump reported as "passed" pump test yet no testing data recorded.

Orleans Avenue Outfall Canal West Side Hydraulic Pumps

Orleans - 1E

05/12-13/2007	Install Pump
05/15/2007	Pump run – QA on site reported pump ran a bit over 15 min at 95% operating pressure.
05/31/2007	Run Pump
07/31/2007	Cited as "passed" AT – However, QA on site (JD) yet no data recorded for any pump runs including this pump, even though other work was recorded done on the site.

Orleans - 2E

05/12-13/2007	Install Pump
05/15/2007	Pump run – QA on site reported pump ran almost 15 min at almost full operating pressure.
05/31/2007	Run Pump
07/31/2007	Cited as "passed" AT – However, QA on site (JD) yet no data recorded for any pump runs including this pump, even though other work was recorded done on the site. Per RE email: this **pump was run for 10 min and then shut down due to a suspected internal hydraulic oil leak in the pump.**
08/16/2007	Per QA report **pump pressure tested and leak found between top-hat and Rineer motor – one of the O-Rings on the high pressure line is also leaking.**
08/17/2007	Per QA report **pump pressure tested and gasket between top-hat and Rineer motor found leaking. Pump retrofitted with lifting eye so Rineeer motor can be pulled and repaired**

Orleans - 3E

05/12-13/2007	Install Pump
05/15/2007	Pump run - QA on site reported pump ran almost 15 min at almost full operating pressure.
05/31/2007	Run Pump

07/31/2007	Cited as "passed" AT – However, QA on site (JD) yet no data recorded for any pump runs including this pump, even though other work was recorded done on the site. Per RE email: **pump run test was attempted but shut down automatically after 45 min. – problem thought to be an engine cooling thermostat.**

Orleans - 4E

05/10/2007	Pull Pump - Install new springs
05/15/2007	Install Pump
05/15/2007	Pump run - QA on site reported pump ran almost 15 min at almost full operating pressure.
05/31/2007	Run Pump
06/19/2007	Cited as "passed" AT – However, per QA report: pump reported as ran yet no testing data recorded.

Orleans - 5E

05/12-13/2007	Install Pump
05/15/2007	Pump run - QA on site reported pump ran 20 min at almost full operating pressure.
05/31/2007	Run Pump
07/31/2007	Cited as "passed" AT – However, QA on site (JD) yet no data recorded for any pump runs including this pump, even though other work was recorded done on the site.
08/17/2007	Per QA report **pump pulled to repair cracked seal - mechanical seal leaking.**
08/21/2007	Pump cited as installed and tested, yet no other data recorded nor QA report to view.

Section 3.2 - Hydraulic Pumping Equipment Failure Issues

Hydraulic pumping equipment failure issues have not been resolved – serious and potentially catastrophic vulnerability issues remain unaddressed.

First, it needs to be reiterated again here, the PSR employees the faulty premise our hydraulic pumping equipment has a life span of 5-7 years. This is a fundamentally flawed premise and renders the findings in the PSR that rely on same without merit/credibility.

The following unresolved failure/potentially catastrophic vulnerability issues will be addressed:

3.2.1 - Acceptance testing.

Please see Section 3.1 "Lack of Credible/Factual Acceptance Testing".

The actual potential vulnerabilities that could lead to catastrophic failure of the hydraulic pumping equipment is extensive – inability to assess the functionality of the installed hydraulic pumping equipment due to insufficient run times at appropriate speeds/pressures, including a lack of credible acceptance testing, has resulted in the inability to establish the mechanical integrity of the hydraulic pumps. There has never been a suitable baseline mechanical integrity established for the hydraulic pumps.

As has been established in previous Sections, the lack of load testing and suitable acceptance testing has allowed the continuation of systemic and predictable hydraulic pumping equipment system failures. The data is clear that when attempts are made to run the hydraulic pumps they demonstrate excessive and serious hydraulic system failures – including failures that have been previously been cited as "cured". **15** of the **40** hydraulic pumps previously cited as retrofitted with more robust Rineer motors and proclaimed ready for duty during the 2006 hurricane season are turned on and run for very limited run times/speeds only to experience a variety of catastrophic failures, including excessive vibrations/pulsations, and a plethora of Rineer motor failure issues. **8** of the **40** hydraulic pumps are cited as "passing" the acceptance testing and are run at and shortly thereafter (couple weeks) at very limited run times/speeds only to experience a variety of catastrophic failures. The obvious is, if a hydraulic pump "passes" in some fashion, acceptance testing or hydraulic system corrective measures, then simply turning the hydraulic pump on shortly thereafter should **not** result in **any** catastrophic failures, and, if they do, then something needs to be done to ensure adequate acceptance testing is reimplemented and whatever "fix" was employed is quickly followed up with suitable mechanical integrity testing (a.k.a. acceptance testing).

It should be noted, none of the hydraulic pumps has been subjected to full operating speeds/pressures for extensive periods of time – actual hydraulic pump runs have been extremely limited in time/speeds. One has to ask; if the failures seen during these limited hydraulic pumps runs are as demonstrated, then what can one expect if these same

hydraulic pumps are subjected to a real life event (pumps required to run at full operating speeds/pressures for extensive periods of time)? I believe when increasing the run times and speeds pressures from limited to full the true overall failure rate will not be linear, it is likely exponential (things will be even worse off).

In addition, there are current failure issues that have gone unaddressed with the hydraulic pumping equipment. These failure issues demonstrate clearly there are current and present dangers to hydraulic pump catastrophic failure should these pumps be required to operate at full operating speeds/pressures (full flow) for extended periods of time (100-year storm event) – e.g. O-Ring/Seal failures, Durst pump drive failures, excessive hydraulic oil temperatures, etc.. Even should these problems be addressed in the future there will still remain the need to perform suitable testing to insure the mechanical integrity of the hydraulic pumps.

3.2.2 - O-Ring/Seal failure issues.

Please see Section 3.1 "Lack of Credible/Factual Acceptance Testing".

This issue has gone unaddressed and represents, in my opinion, an extremely serious problem.

Empirically, the evidence shows that the hydraulic pumps have from day one demonstrated a propensity of experience O-Ring/Seal failures that are catastrophic in nature. The empirical evidence also demonstrates this is a failure mode that is ongoing and currently present in the hydraulic pumps.

Even with the extremely limited field documentation available to me, in just a 3.5 month period during 2007, during very limited hydraulic pumps runs (speeds/time), **8 of the 40** hydraulic pumps experienced O-Ring/Seal failures requiring repair in the field – a repair that could not be accomplished during an actual hurricane event. And, during factory testing, **3 of the 9** hydraulic pumps actually placed in the testing tank (pumped water) experienced what is most likely O-Ring/Seal related failures (I witnessed one such O-Ring failure (saw the failed O-Rings), and two of the other hydraulic pump unit failures were noted as accompanied by loss of hydraulic oil into the testing tank). I am positive, actual O-Ring/Seal failures are likely far more extensive than even reported here.

At issue is the actual pressure rating of the O-Rings/Seals, the excessive hydraulic oil temperatures these O-Rings/Seals have been exposed to, and the likely faulty installation method employed during the commission of the hydraulic pumps in the field.

From the evidence available, turn the hydraulic pumping equipment on, even for very limited run times and speeds/pressures, and you will see catastrophic O-Ring/Seal failures develop throughout the pump run process. The evidence does not support this failure issue simply disappeared, in fact, quite the contrary. Finally, there has never been any suitable mechanical integrity testing nor suitable/credible/factual acceptance testing

accomplished that would provide this failure mode is anything but still present and unaccounted for.

3.2.3 - Hydraulic system design deficiencies.

The Hydraulic Reservoir is Undersized

We have a 180 gal hydraulic oil reservoir, an inlet flow of 340 GPM, and NO baffles in hydraulic oil reservoir. We have issue on turbulent flow inside the hydraulic oil reservoir and inadequate heat dissipation abilities. Hydraulic oil cooler on the side of the hydraulic pump assembly sits 2' further out of the water due to design flaw, let alone the likely inadequate design for the hydraulic oil cooler, let alone the bath water temperature of the water in the canal, and, let alone the inappropriate size of the hydraulic coil reservoir to adequately dissipate excessive heat on its own.

This hydraulic system design deficiency may in fact explain the voluminous number of O-Ring/Seal failures discussed in the previous Section and throughout this Response document.

The Durst Pump Drive is Undersized

Relevant MWI installed and operational hydraulic pump components:

- Caterpillar 3412E DITTA rated 735 hp at 1800 rpm diesel engine
- Durst 2PD10 1:1 ratio Pump Drive

A review of the spec sheets for the supplied Caterpillar diesel engine and Durst pump drive and the Durst application sheet, indicates the output torque of the Caterpillar diesel engine exceeds the maximum allowed input torque of the Durst pump drive (*please see attached spec sheets and application sheet*).

Maximum input torque for the 2PD10 Durst pump drive is **1995 lb ft**. Output torque for the Caterpillar 3412E diesel engine is **2145 lb ft times a service factor**. The Caterpillar **service factor** is **1.5** as these units likely experience uniform loading and are designed to function as components in emergency pumping equipment operated during hurricane events – a direct hit hurricane event obviously last over 3 hours, and more likely far exceeds 10 hours.

As such, using a service factor of 1.5, the output torques from the Caterpillar diesel engine is **3218 lb ft** while the maximum input torque allowed by the Durst pump drive is **1995 lb ft**.

However, of important note, as evidenced from historical hydraulic pump runs in the field (e.g. recorded SCADA data for outfall canal pump runs during Hurricane's Gustov and Ike) the hydraulic pumps spend the bulk of their time (more than ½) running at speeds of between 1250-1550 rpm, and the rest of the time at even lower speeds. This is

important because the lower the prime mover speeds the higher the prime mover output torque - e.g. at 1400 rpm the Caterpillar output torque is 2511 lb ft – times a service factor of 1.5, the input torque the Durst pump drive sees is 3767 lb ft, or almost **twice the maximum allowed.**

History of My Personal First Hand Knowledge Regarding This:

The Contractor (MWI) informed me during a trip visit to their manufacturing facility in Deerfield Beach, Fl., they were changing the supplier for the pump drive – from a Funk pump drive to a Durst pump drive. They informed me they could not get 37 Funk pump drives as they had originally planned and the USACE Contracting Officer would not allow them to supply pump drives from multiple suppliers. As MWI had not provided USACE any specifications for the Durst pump drive I asked them to provide such – they did not comply even when I elevated this request to the head of the TFG pump team. The only info I was able to obtain was a service manual for the Durst pump drive that I found in their offices and asked them to copy for me (*see attached*).

During factory testing I recorded elevated temperatures on the outside of the Durst pump drives (over 200 °F). After witnessing numerous GOCM burning out and elevated temperatures on the outside casing and lines (200+ °F), numerous Denison hydraulic pumps experience catastrophic failure, and numerous hydraulic lines melt/fail, I bought a digital temperature gun to monitor outer temperatures of these various hydraulic components as MWI was refusing to monitor and record these things on their own. In general, I noticed that the GOCM experienced failure quite rapidly when temperatures exceeded 200+ °F on the lines leading to the GOCM and/or the outer body of the GOCM. Related to this, when excessive temperatures were seen at the GOCM a corresponding elevation in temperatures would also be seen on the outside of the Durst pump drive (also as high or exceeding 200 °F).

I suspected multiple factors in the failures I was witnessing, including the Durst pump drive (all components were suspect), and requested MWI to provide me the complete engineering calculations for the entire hydraulic pumping system. At no time during my tour of duty on this project did MWI comply with these request. I made this request over a dozen times, elevated it to the head of the TFG pump team, and still never was given this critical info.

On 13 May 2006 this request was even elevated to an outside USACE engineering support team (the infamous Farkus Team). They also requested this same info as follows:

> MWI should be requested to furnish a complete set of system computations for equipment sizing from the water pump to the diesel engine drive. All current components and pipe sizes should be used. Equipment data sheets should be provided for each piece of equipment used which indicate the exact values being used in the computations. This shall include curves for both the hydraulic motor and diesel engine to determine delivered power (torque) at various operating speeds.

Sometime later MWI responded to this request as follows: "**In process.**"

This cited request and answer is documented in Attachment 2 of the MVN Independent Team Report (ITR) (*please see attached*).

I have since learned that on 19 May 2006 MWI (Jim Endres – lead engineer for MWI) sent the head of the USACE TFG pup team (Jim StGermain) a complete set of hydraulic system calculations – I was never cc'd on any of this info, even when this same email with attached calculation sheet was then forwarded to a separate engineering team within USACE. *This email with attached hydraulic pump system calculations sheet is attached.*

This 19 May 2006 system calculations sheet clearly shows MWI arrived at an assumed maximum overall hydraulic system pressure of **2500 psi** with a corresponding required horsepower supplied by the diesel engine of **531 hp** – the diesel engine actually supplied by MWI delivers **735 hp.** This email with attachment was provided to me by outside parties during mid to late 2008.

In addition, during the period of the USACE MVN ITR (September 2006 through May 2007) the ITR lead technical engineer asked for these same engineering system computations. MWI took more than a month to reply to him with 6 or so excel spreadsheets with various system calculations, and, one of the USACE engineers to receive the 19 May 2006 hydraulic system calculations sheet forwarded same to him during this time period. The excel spreadsheets MWI provided USACE were forwarded to me in November 2006 by the lead technical engineer for the ITR (*please see attached email with cited spreadsheet attachments*). Of important note: there does not appear to be a specific analysis of the diesel engine output torque as relates to the maximum allowed input torque for the pump drive.

Also, in the USACE MVN ITR the main focus of the analysis, with regards to the Caterpillar engine and the Durst pump drive, is the related lack of a clutch starting system as it affected the hydraulic piping (shock loading of the hydraulic pipe), not the miss-matched prime mover and drive train systems.

Regarding the Durst pump drive, MWI considered it to be adequately designed and did not specify any limitations/changes placed on the system during operations. In addition, to my knowledge, USACE (the Contracting Officer) did not have a differing opinion than MWI on this matter. This characterization of blanket suitability is consistent with how MWI characterizes/ed most all hydraulic components of their hydraulic pumping system, regardless of the varied and voluminous hydraulic pump component failures and the refusal/failure of MWI to address same (determine root cause in lieu of simply removing and replacing the offending/failed hydraulic component with no forensic or engineering analysis). In addition, the blanket acceptance of MWI's assessments of hydraulic pumping equipment suitability was also consistent with how USACE TFG/TFH personnel addressed these failure issues/engineering inconsistencies.

Additional Information Relevant to This:

There is existing documentation I have obtained that indicates there have been severe and extensive problems associated with Durst pump drives and GOCM's during subsequent field operations. Specifically, Quality Assurance (QA) reports from the short period of time during 'acceptance' testing (June-September 2007) indicates there were numerous failure issues/problems associated with the Durst pump drives and GOCM's. In addition, emails from USACE personnel in the field from a three day time period speak to these Durst pump drive and GOCM failure issues – excerpts as follows:

Email sent on 03 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

> Pump 3E had an oil circ pump problem, so we're back to running 2E at a reduced speed in order to get 1E past the test.

Email sent on 03 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

> Pump no 2W had a gear drive temp problem after 25 min, so we're shutting it down and running 1W.

Email sent on 04 August 2007 from a USACE Construction Representative in the field to the TFH pump team stating:

> Pump 2w failed after 1/2 hour because the gear oil in the Durst overheated.
> ...
> Pump 3e failed because the gear oil in the Durst overheated.

Email sent on 05 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

> Pump 4W had a Durst drive oil temp problem and only ran for half an hour. It also developed a small leak at a coupling on the platform at the PU.

Email sent on 05 August 2007 from the USACE Resident Engineer to the TFH pump team stating:

> We appear to have an epidemic of Durst drive oil circulation pump problems. We're shutting down the east pump test and moving to test two west pumps.

3.2.4 - Gear Oil Circulation Motor/Durst Drive failure issues.

Please see Section above – and, also where USACE Field Resident Engineer characterizes the Durst drive failures seen during August 2007 acceptance test runs as "epidemic" in nature.

3.2.5 - High pressure hydraulic pipe failure issues.

The issue of hydraulic piping supplied by the contractor not in accordance with accepted industry standards has not been sufficiently addressed. The PSR makes no statement they have analyzed the hydraulic pipe and arrived at an official "fit-for-service" designation. In fact, the PSR makes no attempt to address the complete issue as I have brought forward in my original response to the first DoDIG Report.

Simply implying a suitability based on vague and incomplete analysis is not sufficient. Using the numbers as provided in the PSR still yields pipe thicknesses that are wholly unsuitable, regardless of the obvious problems that also went unaddressed.

Recapping what has been discussed prior:

There is no mention in the PSR what other considerations were made in the apparent "analysis" – missing would be some consideration for a significant additional loss of pipe thickness due to the ensuing sand blasting the hydraulic steel pipe is/was to undergo for subsequent painting. In addition, the environmental conditions the pipe has been subject to appear to have been glanced over – the pipe has been subject to a very harsh corrosive environment – installed directly over salty/brackish water for more than three (3) years.

Regardless, using Parsons ridiculously low value for corrosion would still yield our pipe is still unsuitable:

$$t_{min} = \frac{PD}{2\,(SE + PY)} \qquad (\text{for } t_{min} < D/6)$$

S = 16,000 psi — *Stress value for material* from Table A-1, Basic Allowable Stresses in Tension for Metals, ASTM B31.3 (16ksi for this temperature range)

E = 1.0 — *Quality factor* from Table A-1, Basic Allowable Stresses in Tension for Metals, ASTM B31.3 (seamless pipe)

D = 3.5" — *Outside diameter of pipe*

Y = 0.4 — *Coefficient* from Table 304.1.1 (valid for t < D/6) - temp < 900 °F

Therefore, t_{min} **= 0.3052326"**

Add Corrosion Allowance (CA) as provided by Parsons:

$$t_{corr} = t_{min} + CA = 0.3052326" + 0.02" = \mathbf{0.325233"}$$

Adjust For Mill Tolerance:

$$t_{total} = t_{corr}/0.875 = 0.325233"/0.875 = \mathbf{0.3717"}$$

Determine the appropriate Pipe Schedule from table: for 0.3717" wall thickness, Schedule 160 = 0.438" wall thickness – our pipe is Schedule 80 = 0.300 "...**meaning, our Schedule 80 pipe is undersized.**

FYI, our steel pipe is from Spain – I decided to check the mill certs that came with the pipe, and, also decided to have our site piping contractor cut a random piece of pipe to check the mill tolerances. As I suspected, the pipe that is used in the construction of our hydraulic pipe physically exhibited the over and under pipe thicknesses specified by the mill certs, a +- 0.375".

Not only does ASME B31.3 required an adjustment for mill tolerance, but my own physical inspection of the pipe verified the hydraulic pipe exhibited areas of thickness less than 0.300" and down as far as 2.625".

In addition, and extremely important, USACE's high pressure hydraulic pipe was fabricated using the materials MWI provided – this resulted in the pipe being fabricated utilizing **socket weld fitting and welding**. Per the ASTM Code, **socket welds cannot be used for high pressure piping** (to determine if high pressure ASME B31.3 references ASTM B16.5 where high pressure equates to 2500 psi and over). USACE's pipe experiences were in excess of 3200 psi. Therefore, the hydraulic pipe as fabricated using the materials MWI provided violates the Code. Nowhere in the PSR is this issue addressed.

3.2.6 - Excessive hydraulic system pressures and related hydraulic component failures.

The issue of excessive hydraulic system pressures and related hydraulic component failures have not been addressed sufficiently nor resolved. The PSR also states to cause less undue stress on the hydraulic pumping system just run the hydraulic systems at lower pressures, problem fixed – in actuality; this is not the appropriate engineering solution to this problem (see above discussion on undersized Durst pump drive).

Section 3.3 - Hydraulic Pump Runs During Hurricanes Gustav and Ike.

A vast mount of discussion on this subject is found in previous Sections. Please see the following:

- Section 1 – pages 7 to 10.
- Section 2 – pages 14 to 15
- Section 2 – pages 34 to 39

Highlighting something that is quite important, and likely to get lost in the vast amount of information being presented, is the fact the PSR bases its analysis and findings on the faulty premise the hydraulic pumping equipment was built for a design rainfall storm event of 10-years – the true/factual design storm event for the hydraulic pumping equipment, as reported to Congress and the public, is for a 100-year storm event (e.g. Hurricane Rita). Any and all analysis proffered using this faulty basis is without credibility.

Also, recapping some additional important aspects of this issue: The hydraulic pump runs during Hurricanes Gustav and Ike were not as reported in the PSR. None of the pump run data reported in the PSR constitutes factual/truthful reporting. Actual hydraulic pumps run data provides and proves a plethora of contradictory conclusions to the PSR – including a prima facia case for official USACE reporting forward that constitutes an organized white wash intended to provide cover as to the true condition of the hydraulic pumping equipment.

Hydraulic pumps, for both hurricane events, were not responsible for establishing and maintaining Safe Water Levels (SWL). Hydraulic pumps were used sparingly and intermittently, run at significantly reduced pressures/speeds, and run for very limited amounts of time. Hydraulic pump runs, for both hurricane events, can at best be characterized as "exercise"/"demonstration" type pump runs, and, proved nothing as to the functionality and operability of the hydraulic pumps.

Direct Drive pumps, for both Hurricane events, were the workhorses for all pump runs accomplished. Direct drive pumps were responsible for establishing and maintaining SWLs. Direct drive pumps were used extensively and comprise the lion's share of total pump run time.

The facts, and SACDA data, show storm surge as experienced at the gated closure structures, for hurricane Gustav **never** reached or exceeded the Safe Water Level (SWL) - had the gates never been closed for this event there would have been **no** adverse affect to the city of New Orleans from flooding.

In addition, during hurricane Ike, the facts, and SACDA data, show storm surge as experienced at the 17th Street gated closure structures **never** reached or exceeded the Safe Water Level (SWL). Had the gates never been closed at 17th Street for this event there would have been **no** adverse affect to the city of New Orleans from flooding. And,

during hurricane Ike, the facts and SCADA data show storm surge did reach the SWL at London Avenue (5.0') with a maximum surge water level of 5.39'. However, what is not reported in the PSR is during Hurricane Ike the hydraulic pumps were hardly run at all – they were relegated to 'exercise' type runs. At London Avenue it was the direct drive pumps that were utilized to initially bring canal water levels down, and, it was direct drive pumps that were utilized to maintain these same water levels prior to any hydraulic pumps ever being turned on and operated.

It is important a complete reading of the above cited Sections is accomplished.

<u>The following is intended to graphically augment the data/documentation that is presented previously in this response document.</u>

Graphical representation of actual hydraulic pump runs during both Hurricane Gustav and Ike – actual graphs are unable to copy/paste correctly into this document. Please see separately the following attached files:

- Gustov Pump Run Graphs.xls
  - [Sheet 1] 17th Pump Run data – Gustov
  - [Sheet 2] London Pump Run Data - Gusatov
- Canal Level & time vs Hyd & DD Pump Runs - Gustov.xls
  - [Sheet 1] 17th St. Gustav
  - [Sheet 2] London Ave. Gustav
- Ike - Graph.xls
  - [Sheet 1] Ike Pump Run Data For 17th
  - [Sheet 2] Ike Pump Run Data For London
- Canal Level & time vs Hyd & DD Pump Runs -IKE.xls
  - [Sheet 1] 17th St. – IKE
  - [Sheet 2] London Ave. - IKE

The above graphical representation of actual hydraulic pump runs during both Hurricane Gustav and Ike were compiled using the actual pump run SCADA data.

Section 3.4 – Authorized and Intended Lifespan of Pumping Equipment Installed at the Three Closure Structures.

To start, a vast mount of discussion on this subject is found in previous Sections. Please see the following:

- Response – pages 2 to 3.
- Section 2 – pages 28 to 29

The PSR bases analysis of the hydraulic pumping equipment on a 5-7 year life span. This is a ludicrous position for many reasons.

First, our contract for the hydraulic pumping equipment does not provide for this severely underestimated life span. Nowhere in our contract is there any discussion of a severely reduced life span for the hydraulic pumping equipment. In fact, our contract calls out for bearing life of 50,000 hours – for emergency pumping equipment to be utilized during possible hurricane storm events this equates to an extensive life span (as opposed to agriculture pumps that are used more extensively). Running the hydraulic for a period of time equal to "full time work days" provides for a 25 year life span – as I understand this equates to what is termed a "high usage" type pump (2,000 hrs/year). Regardless, 50,000 hours for emergency operations pumps represents a very long life span, likely in excess of 50 years.

Next, the Commander of HPO, Col Bedey, **stated publically** our closure structures with pumps installed have a **50** year life span. To highlight, a very brief snip-it from one of Col Bedey's <u>many</u> public statements on the life span of the interim closure structures with installed pumps, <u>recorded</u> on February 12, 2008:

> "....We have temporary closure structures at the 17trh St. Canal, Orleans and London. Those are interim,....Interim protection provides 100-year protection but not permanent nature protection. We have 100-year protection in place but we don't have permanent protection in place. These have something around a 50-year lifespan. These were designed to there for 50-years."

Next, our project as funded and authorized by Congress does not provide for "temporary" pumps (life span 5-7 years) that are installed onto the closure structures. The project as funded and authorized by Congress calls for interim closure structures with pumps installed and additional temporary/rental pumps utilized each year as necessary to augment the pumping capacity for the outfall canals. Specifically, because only a limited amount of structure and pumping capacity was able to be built/installed at the beginning of the first 2006 hurricane season 14 additional temporary/rental pumps were added to the 17th outfall canal to increase the available pumping capacity. In addition, for the following 2007 hurricane season, additional pump platform structures were built at 17th St. and London Ave, and additional pumps installed which increased the interim available pumping capacity at each outfall canal – however, for 2007 again additional "temporary/rental" pumps were utilized at 17th street to further increase pumping capacity. It was the pumping capacity that was temporary, not the pumps.

I would also state this; who in the world would spend over ½ Billion dollars on something that has a life span of 5 years? $100M every year. The cost for true "temporary" and "interim" canal closures (build truly temporary platforms w/movable platforms and drive sheet pile) with pumping capacity (rent pumps) surely would not cost even a **tiny fraction** of this amount.... proposing ½ Billion dollars for something that has a life span of 5 year when the alternative for truly temporary" measures is so much less fails the "common horse sense" test.....

Finally, our project as funded and authorized by Congress provided 50 year protection with follow on projects to increase this level of protection to 100 year level of protection. One of the very first official USACE documents for this project, the Project Information report (PIR), dated June 2006, utilized a Cost Analysis with a 50 year life span period for our project.

It appears, after review of various House Bills, ensuing enacted Public Laws, and an evasive and unresponsive Report to Congress from the USACE, that this project was redefined mid-stream, effectively abandoned in place, by the USACE without the apparent knowledge or consent of Congress - likely to avert the attention being focused on the defective hydraulic pumping equipment installed at all three outfall closure structures.

Specifically, up to and including April 2007, our project was built with the understanding follow on projects (phases) would augment the newly built closure structures with pumps installed by building additional pump platforms with pumps installed until a 100 year level of protection was achieved. There is a plethora of official documentation to support this including Public Laws, official USACE project reports, and official testimony by USACE TFH Leaders/Commanders. A small sampling of this documentation is as follows:

- P.L. 109-234
- P.L. 110-28
- Alternative Considerations Report – Phase 2 Conceptual Design Services For Permanent Flood Stations and Canal Closures at Outfalls dated December 12, 2006. [to be provided in attachment]
- Testimony by Ms. Karen Durham-Aguilera held at the Louisiana State Capitol Building on April 12, 2007. [transcript to be provided in attachment]

Then, soon after this, documents from USACE began to surface that sought to disregard the direction give by Congress in P.L. 110-28, and future project planning for our project called for the existing closure structures with installed pumps to be abandoned in place (removed by 2013) and similar gated closure structures with pumps installed built a few 100 yards further down stream. There is also a great deal of documentation on this, three of which are:

- USACE Report to Congress dated August 30, 2007. [to be provided in attachment]
- USACE Permanent Canal Closures and Pumps Industry Day Brief dated January 21, 2009. [to be provided in attachment]
- The Parsons supplementary report

What becomes painfully clear is USACE did not follow the specific direction given to them by Congress (P.L.110-28) and instead chose to investigate three completely different future project options, which in effect provided for abandoning the newly built closure structures with pumps installed in place. Interestingly, in this Report to Congress USACE makes every effort, at all levels of the supposed 'investigation' to not even mention, in passing or directly, the very existence of the newly built closure structures with pumps installed – incredibly, even when two of the USACE redefined viable future project options proposed the building of identical in nature closure structures (one gated, one permanent closure) with installed pumps no more than a few hundred yards further downstream from the newly built closure structures with installed pumps.

What also becomes clear is the Report to Congress is a very good vehicle for confusing the lines of what the project description is/was/will be – by that I mean by completely omitting the very existence of any newly built closure structures with installed pumps to deal with the reader could very well think the Report is actually talking about building the already existing project, not a completely new project…I hope that makes sense.

All I can say is Congress was not aware they were spending over ½ Billion dollars on a project only to abandon it in place and then move a few 100 yards further downstream and build a similar project (gated closure structures with installed pumps). In addition, Congress, USACE documentation, and the contract for this project supports the reasonable position that our hydraulic pumps were purchased with the intention they be suitable for service far beyond the PSR's contended life span of 5-7 years.

The only reason the hydraulic pumps are no longer required to be of service beyond 5-7 years is because they are defective and not suited for the service they were intended for. Saying there was always a plan in place to remove them is a cover for removing them, and, that plan appears to only have grown legs once it became painfully obvious the hydraulic pumps were not suited for their intended service; operational pumps.

<u>Official congressional actions defining what Congress believes was to be/is to be the project to build closure structures and install pumps at all three outfall Canals; 17th St., Orleans Ave., and London Ave.</u>

PUBLIC LAW 109–234—JUNE 15, 2006. Provides the funds to build outfall canal closure structures and install pumps at 17th Street, London Avenue, and Orleans Avenue. Public Law 110-28 specifically states:

"That the Secretary of the Army is directed to use the funds appropriated under this heading to….. provide hurricane and storm damage reduction and flood damage

reduction in the greater New Orleans and surrounding areas; $530,000,000 shall be used to modify the 17th Street, Orleans Avenue, and London Avenue drainage canals and install pumps and closure structures at or near the lakefront;."

PUBLIC LAW 110–28 MAY 25, 2007, Provides the funds to perform an analysis of three specific follow on project options and determine which was best suited to provide eventual 100-year storm protection. Congress explicitly specified that two of the future follow-on project options would involve incorporating the newly built closure structures with installed pumps into the final solution for providing the 100-year level of protection. The last project option that Congress directed be investigated was simply repairing/rebuilding the damaged/failed levees and floodwalls. Public Law 110–28 specifically states:

> "The Chief of Engineers shall investigate the overall technical advantages, disadvantages and operational effectiveness of operating the new pumping stations at the mouths of the 17th Street, Orleans Avenue and London Avenue canals in the New Orleans area directed for construction in Public Law 109–234 concurrently or in series with existing pumping stations serving these canals and the advantages, disadvantages and technical operational effectiveness of removing the existing pumping stations and configuring the new pumping stations and associated canals to handle all needed discharges to the lakefront or in combination with discharges directly to the Mississippi River in Jefferson Parish; and the advantages, disadvantages and technical operational effectiveness of replacing or improving the floodwalls and levees adjacent to the three outfall canals:"

PUBLIC LAW 110–252—JUNE 30, 2008. Provides additional funds in the amount of $704M to modify the 17th Street, Orleans Avenue, and London Avenue drainage canals and install pumps and closure structures at or near the lakefront;

Interestingly, the project, as Congress appears to have understood it in P.L. 109-234 and P.L. 110-28 is just as it was described to me when I first arrived in New Orleans to work on the project (i.e. the closure structures with temporary pumps were not temporary in the physical sense, it was the pumping capacity of the interim pumping stations that was temporary – more pumps with associated structures were to be built to augment the newly built closure structures with installed pumps in the following year with possible added projects (floodwall repair, etc.) to maximize the ability to meet/exceed the 100-year protection promised to the people of New Orleans). Only when I later reported the hydraulic pumping equipment being installed at the outfall canals as defective did there then come about a revised project definition that attempted to paint the newly built closure structures as now temporary in the sense they were to be abandoned and "permanent" closure structures built a few hundred yards further downstream at the mouth of the outfall canals.

Unfortunately, Congress, being purposely mislead, and likely very confused as to the validity of the project options being proffered by the USACE in their Report to Congress was then guided into passing a recent House Bill that now provides an additional $704M to apparently build a second closure structure with pumps installed at all three outfall canals. It appears Congress in on their way to paying twice for the same project without being informed as to why the first closure structures with pumps installed are unsuitable to continue forward as directed in P.L. 109-234 and P.L. 110-28.

What this constitutes I cannot say specifically, but, at a minimum I believe there should be more done with regards to investigating if these actions constitute the misappropriation of funds, a gross example of an attempted cover-up, or violations of other various Statutes/Rules/Acts (Purpose Statute, Necessary Expense Rule, Anti-Deficiency Act , etc.)....

Bottom line, our closure structures with installed pumps were never meant to be anything less than industry standard type procurements with life spans similar, as defined by the contract, and, as defined by Public Law.

Section 3.5 – Permanent Enhancement of the ICS Facilities Final Report dated April 27,2009.

This Report, published on April 27, 2009, and prepared for USACE, MVD, NOD by ECM-GEC Joint Venture, investigates and reports forward on what modifications are required to extend the life of the Interim Control Structures (ICS) at all three outfall canals to a 50 year design life. This report and its determinations are represented in the Draft Individual Report, IER #5, dated May 2009, to evaluate the potential impacts associated with the construction and maintenance of the permanent protection system for the 17th Street, Orleans Avenue, and London Avenue outfall Canals.

Pumping capacity was investigated and modifications to the existing ICS were identified that would meet the pumping capacity associated with a 100 year storm event. The identified ICS facility modifications required were as follows:

- Provide an additional 2,800 cfs of **direct drive** type pumps at the 17th Street Outfall Canal with associated piping with support structures.
- Provide an additional 750 cfs of **direct drive** type pumps at the Orleans Avenue Outfall Canal with associated piping with support structures.
- Provide an additional 2,100 cfs of **direct drive** type pumps at the London Avenue Outfall Canal with associated piping with support structures.

Operation and maintenance issues were investigated and modifications to the existing ICS were identified that would extend the life of the ICS at all three outfall canals to a 50 year design life. The significant identified ICS facility modifications (higher dollar) required were as follows:

- Remove all the hydraulic pumping Equipment from all three Outfall Canals and their associated piping and support structures.
- Replace all the removed hydraulic pumps with direct drive type pumps and associated support structures.
- Replace the existing knife gates with roller gates.

The basis overall recommendation of the Report is that the hydraulic pumps, and all their associated components and their associated structures, be removed and replaced with more reliable direct drive pumps.

The Report goes on to list specific deficiencies/problematic issues associated with/surrounding the hydraulic pumps:

- The hydraulic pumps are in-efficient.
- The hydraulic pumps are subject to corrosion and leakage.
- The hydraulic pump cooling capacity is subject to maintenance problems related to biologic growth and floating material.
- The distance between the hydraulic pump and the power units exceed the recommended distance per the manufacture – incredibly even though the

manufacturer is responsible for the design of same (design a pumping system with the associated separation distances).

- The hydraulic fluid pressure in the hydraulic pipe may exceed the allowable 3000 psi capacity of the pipe.
- The hydraulic pumps pose excessive danger related to hydraulic oil spills.
- It is doubtful the hydraulic pumps can operate at lake levels resulting from a lake surge.
- Physical model tests were performed on the 17th Street and London Avenue Pumping Stations and indicated that the performance of the pumping station intakes was un-acceptable. Recommend replacing all hydraulic pumps with direct drive pumps.
-

Incredible, the $431M cost estimate for the modifications required to extend the life of the ICS at all three outfall canals to a 50 year design life, and the addition of additional direct drive type pumps to meet the pumping capacity associated with a 100 year storm event, is **half** that of the preferred proposed action identified in the Draft Individual Environmental Report, dated May 2009, and released for public comment by USACE May 04, 2009. Recapping, the preferred proposed action called out in IER #5 is to abandon in place the existing gated closure structures with installed pumps and build similar gated closure structures with installed pumps (direct drive pumps, not hydraulic pumps) a few 100 yards further downstream.

SECTION 4 – Conclusion

Simply restating the following does not suffice: "After a thorough review, the PSR can only be defined as a document completely without credibility. It's findings are not based on an analysis of the facts as they exist(ed) nor any real rigorous engineering and mathematical interpretation, and, can be refuted with a plethora of documentation to the contrary that can effectively demonstrate egregious untrue statements in fact, false demonstrations, blatant errors, mischaracterizations, and omissions of significant scale."

The PSR

For 70 pages I have been focused on being professional in my analysis of the egregiously lacking assessments I have been tasked to observe and report on. But I am suffering an internal storm that I feel deserves to find a voice in this document.

As engineers we have an obligation to use our knowledge and practice our profession to the benefit of those we serve and to not cause harm. Our duty is first and paramount to our fellow citizens, not our employer. To help make it easier to understand – I may be able to engineer the perfect widget for my employer that makes them wealthy beyond all measure, however, if I know the widget I designed will cause serious harm to those around it I cannot promote or advocate it's viability for widespread public use, neither can I seek to hide the harm this widget would cause if operated.

In our profession there may be no general agreement reached as to the 'nature' of engineering, or a universally acceptable definition, however, there has never been an acceptable measure named that equates the possibility of parity between storm events separated by $\log_{10}$ energies, nor, symmetry in life spans separated by 10 fold differences in expected and customary life span.

If such existed, I would call this the "tidy universe" of a DoDIG/Parsons nature of just what engineering reality existed. Our universe is not 'tidy' when the mathematics do not support the reality that surrounds us.

Parsons "Engineering Assessment" of the hydraulic pumping equipment is simply lowering the bar so low that one trips over it when passing. The only level that's worse is to roll the bar on the floor - i.e. the hydraulic pumps are fit-for-service as long as they survive a really strong mist and operate no longer than 6 minutes at 55% operating speeds. Or, even worse, the mathematical improbably that a storm will even hit the New Orleans area in the 1-3 year life span the pumps have left, i.e. 100% mathematical probably the hydraulic pumps will never be needed and can therefore be declared 'fit-for-service' "as long as they don't need to turn them on". Actually, this seems to be their argument ("we are abandoning these $530M one's here and building new $800M ones a stones throw away over there…in 3 years").

Equally problematic is the "my column of numbers adds up to the right answer" assessment – and even when they don't, who's going to check? This attempts to cover major issues with pages of Tables and Charts that make the bottom line numbers look even more impressive, no matter what the mathematical reality is.

Even worse is refusing to acknowledge the very existence of the design deficiencies/problematic issues requiring assessment. What Durst pump drive? What hydraulic oil reservoir….

And then there is the "because I said so" assessment which supplements opinions for facts. When high pressure hydraulic pipe issues still give you problems, just use the "because I said so" assessment. You don't need to address Code violations for materials used and construction methods employed, nor do you have to address the shortcomings of your recalculations.

Such flawed analysis is useful for making billions in government contracts, but clearly sacrifices public safety.

Notice the Parsons SR never names the engineers responsible for its content. Why would an Engineering Assessment of such critical importance that the Secretary of Defense ordered it accomplished never cite an author? I don't have any recollection of ever seeing anything like this in the engineering profession - an Engineering Assessment of such critical importance where the engineers who do the assessment won't even put their names on it even when it is publically published – and, even though their profession mandates accountability and transparency in all such matters. I guess I've stumbled over the "Black Ops" Section at Parsons.

<u>What is known</u>

The facts as they have presented themselves throughout this entire process have provided a significant base of understanding as to the unsuitable condition and likely inoperability of the hydraulic pumping equipment for the purpose intended (able to be operated as emergency pumping equipment; i.e. operated at full operating speeds/pressures for extended periods of time).

Specifically, we know of two significant design deficiencies – both of which are of such magnitude further operation of the hydraulic pumping equipment without measures taken to remedy the design deficiencies **will** result in further catastrophic failures (as already evidenced by a plethora of unremitting Durst pump drive failures/overheating and O-Ring/Seal failures).

We also know the high pressure hydraulic piping is undersized, was constructed using inappropriate materials and methods, and possesses significant danger not only to catastrophic failure but also to operator safety.

We also know the hydraulic pumping equipment has never been operated such that it would satisfy a mechanical integrity test as provided by HI Standards. Associated with this we also know the acceptance testing USACE and the PSR purports as having been successfully completed in fact never was, and, the actual USACE QA documentation for the acceptance testing and other related USACE testing documentation proves there is

much to be concerned about with regards to the sustainable operability of the hydraulic pumping equipment.

We also know the hydraulic pump runs the PSR purports as having been accomplished during Hurricanes Gustav and Ike in fact did not occur, and, actual SCADA for this proves the hydraulic pumps were in fact never utilized to initially bring canal water levels nor were they needed to keep the city of New Orleans safe from flooding. In fact, the records show it was the direct drive pumps that were initiated and run to bring down canal water levels, and, it was direct drive pumps that were employed the lions share of all pump run time. The SCADA data proves the hydraulic pumps were not utilized when the highest canal water levels were present in the beginning, were not allowed to run at full operating speeds/pressures, nor allowed to run for extended periods of time - they were instead relegated to an "also pumped" status that was then turned into a straw man for hydraulic pump performance that was offered up to the highest levels of USACE. The recorded storm SCADA data shows clearly the hydraulic pump runs were not examples of pumping performance that replicates that as seen in a true Hurricane event, they are instead examples of what can be called "demonstration/exercise" runs.

We also know the hydraulic pumping equipment currently installed at all three outfall canal structures was authorized, funded, and procured to provide protection from a 100-year storm event with a 50-year design life. Associated with this we also know as of less than three weeks ago USACE published a Report which investigated and recommended modifications required to extend the life of the Interim Control Structures (ICS) at all three outfall canals to a 50 year design life. Specifically, this report recommends all the currently installed direct drive pumps remain and all the currently installed hydraulic pumps and their associated piping and support structures be removed and replaced with direct drive pumps and associated structures at all three outfall canals – citing problematic operational and maintenance issues surrounding the hydraulic pumps.

Given what is known today, through this Response document, and through 3 years of investigation and observation, I have no reservations in offering my assessment of the hydraulic pumping equipment. The more they are run, the more likely catastrophic failures will occur. If they are turned on in a real hurricane they will fail in ways that will astound the observer. The question I am left with is why did this happen, and why was this allowed to happen?

My answer is: loyalty and dedication to duty has **not** been focused on the citizens we serve. Loyalty and dedication to duty has instead been focused on the superiors we receive our taskings from and answer to on a daily basis, on the federal agencies we are employed by and their leaders, and on political Administrations in power and their self interests. All efforts have been focused on ordering performance and reporting back with no deviations, whether or not the performance rose to an acceptable level of engineering competence, or professional accountability.

Therefore, I am asking for this process to somehow provide remedy and accountability for the issues I have brought forward. But, even more importantly, I am asking for the

establishment of ***informed consent*** which so far has been denied the citizens of New Orleans. Every American citizen deserves the right to exercise informed consent with regard to the information their Government or its agents presents to them – to deny such is an affront to the very foundation of our rights as Americans.

I also believe that it is paramount for USACE to pursue accountability and transparency in this matter. To date, neither one has made its mark on this project. Without them, one cannot reasonably expect there to be any improvement in the situation, or different result in the future. To fail means that innocent and undeserving people continue to be at risk of losing their lives and welfare, without even being informed. They deserve to know the dangers they face and they deserve our best efforts to remedy this situation.

I remain profoundly grateful to USACE for the opportunity to serve our nation and the people of New Orleans, and submit this Response in furtherance of that mission.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Respectfully submitted, on this day, May 14, 2009,

Maria E. Garzino
Civil/Mechanical Engineer
USACE, Los Angeles District

cc: The Honorable Henry A. Waxman
United States House of Representatives
Committee on Oversight and Government reform
2157 Rayburn House Office Building
Washington, D.C. 20515

Appendix - Listing of Cited Documents and Attachments

- "MEMORANDI FOR RECORD - Factory Testing Requirements and Field Testing Requirements of the Pumping Equipment as Provided For by Contract No. W912P8-06-C-0089:"

- Spec sheet for the supplied Caterpillar diesel engine.

- Spec sheets for the Durst pump drive and the Durst application sheet.

- Gustov Pump Run Graphs.xls
  - [Sheet 1] 17th Pump Run data – Gustov
  - [Sheet 2] London Pump Run Data – Gusatov

- Canal Level & time vs Hyd & DD Pump Runs - Gustov.xls
  - [Sheet 1] 17th St. Gustav
  - [Sheet 2] London Ave. Gustav

- Ike - Graph.xls
  - [Sheet 1] Ike Pump Run Data For 17th
  - [Sheet 2] Ike Pump Run Data For London

- Canal Level & time vs Hyd & DD Pump Runs -IKE.xls
  - [Sheet 1] 17th St. – IKE
  - [Sheet 2] London Ave. - IKE

- Transcript of testimony by Ms. Karen Durham-Aguilera held at the Louisiana State Capitol Building on April 12, 2007.

- Alternative Considerations Report – Phase 2 Conceptual Design Services For Permanent Flood Stations and Canal Closures at Outfalls dated December 12, 2006.

- USACE Report to Congress dated August 30, 2007.

- USACE Permanent Canal Closures and Pumps Industry Day Brief dated January 21, 2009.

- Permanent Enhancement of the ICS Facilities Final Report dated April 27,2009 – Prepared For U.S. Army Corps of Engineers, Mississippi River Division, New Orleans District by ECM-GEC Joint Venture, In Association With Black & Veatch Special Projects Corp.