ORIGINAL REQUEST – PN-MICI002-2011

Dear Inter-American Development Bank/MICI representatives,

There is no question that the long-term operational success of a financially sound expansion of the Panama Canal is desired by the global community, which continues to support it through various investment mechanisms.

This letter is a Request for a review of the current plan being followed by the project because of concerns that the project – which has received substantial funding from the Inter-American Development Bank (IADB) on our community's behalf – creates unacceptable permanent threats not only to itself but to the reliability of the future system, its safety and its expected return-on-investment.

Two fundamental issues remain unaddressed:

- A dam being built across seismically active faults introducing the potential for the catastrophic loss of a world-important freshwater reservoir and an extended closure of the Panama Canal, impacting world trade indefinitely

- A saltwater "passage" across the Isthmus – conditions for which are being installed – that will degrade the oceans, affecting shared coastal and marine resources, and inciting a biological destabilization of the region

This plan needlessly increases the Panama Canal's vulnerability to disaster, in contradiction to key objectives of the IADB's Environment and Safeguards Compliance Policy and other international principles of sustainable development. In addition, its transboundary impacts and significant conversions of natural habitats will affect life far beyond Panama's shores.

Concern among stakeholders has grown with the multiple infrastructure failures Panama suffered at the beginning of this year. Most of what failed was built by projects that were at least partially funded by international financial institutions and third parties that by all appearances:

- were taken in by the excitement surrounding the project itself, and/or

- failed to truly independently verify and certify designs, procedures and assertions.

These events serve to strengthen perceptions that information used to gain approval for the expansion project and obtain investment funds may have been manipulated by:

- misrepresentation of facts about the project to the people of Panama and of other nations

o non-disclosure of avoidable economic risks including loss of the investment

o non-disclosure of unnecessary negative impacts on the environment

o non-disclosure of damages to third parties and unacceptable threats to life

- incomplete disclosure of pre-selection evaluations of non-sustainable and risky choices
  - insufficient assessment of design challenges
  - inadequate search for alternative solutions
- lack of transparency regarding future performance issues
  - no available & implementable mitigation option
  - no reasonable contingency plans
- unrealistic and inadequate projections of effects on local and global communities

At this stage, the Panamanian people and other stakeholders are not empowered to do more than use mechanisms such as this Request initiates, and trust in the IADB and the greater financial community to:

- employ the appropriate review mechanisms to protect them and this critical asset,
- overcome resistance to change, especially when it lowers risk, and
- obtain full compliance with the requirements defined by the international community.

Fortunately, well-known and previously-proven techniques permits us to eliminate taking counterproductive risks with the Panama Canal. Your review will find that with relatively straightforward modifications – using economical and feasible technical alternatives – this project can:

- meet its stated objectives,
- provide a far greater return-on-investment,
- eliminate creating unnecessary risks
- ensure an efficient and rational use of natural resources,
- safeguard the ecology of both oceans and the canal's freshwater reserves,
- delay indefinitely, or remove, the need to relocate communities for watershed expansion, and
- increase the Panama Canal's service, reliability and future growth potential.

It is not too late to make modifications to the current project plan with which the Panama Canal is being expanded.

The perception exists, however, that it is impossible to introduce changes to projects at this stage – no matter how beneficial, logical or essential they are.

Even political leaders in Panama – while referring to the current Panama Canal expansion project as a "disaster" – hesitate to call for revisions to it. This, despite expressing equally negative conclusions about other aspects of the venture.

Nevertheless, facilitating responsible change is a fundamental reason review and compliance processes exist. Recent events highlight that we must take corrective action when we still can to avoid wishing we had done so after a tragedy has struck. We know now, for example, that the blowout in the Gulf of Mexico last year could have been avoided by better design choices and proper implementation of them and of operating procedures, While natural events like the recent massive earthquake in Japan cannot be prevented, we have witnessed the value of proactively applying available technology more effectively to reduce impacts of such quakes.

The Panama Canal expansion is an engineering project. Its success ultimately rests on its engineering. Other major engineering projects worldwide are underway counting on its promised outcome, along with stakeholders. Clear facts and data provided by a truly open and comparative assessment will settle the doubts.

Accompanying this request is a document (copied below) that summarizes solutions engineered to resolve key challenges the expansion presents. Further unbiased evaluation would be indicated as they already favorably have received from independent subject-matter-experts, academics and professionals in various countries. The document was received by our committee from Bert G. Shelton, a research scientist and professional engineer with extensive background on this subject and highly qualified to comment on it. He established the independent research and investigation team that has worked in parallel to the expansion project since early 2003.

It still possible to create a truly sustainable expanded Panama Canal that is reliable, safe and profitable – if we apply known systems and methods. If we do anything less, the losses will be unrecoverable.

I look forward to receiving your response and to providing you with any information you may require. If there are other entities within the IADB I should address with this matter, I would appreciate your letting me know.

Sincerely yours,

Leila Shelton-Louhi

05 May 2011

Document below: "Questioning the Panama Canal Expansion Project's Compliance with Loan Stipulations"

Leila Shelton-Louhi, Director, Gatún Lake Defense Committee (Comité ProDefensa del Lago Gatún)

AlianzaProPanama@hotmail.com

The Gatún Lake Defense Committee advocates for a genuinely responsible and sustainable expansion of the Panama Canal, where its valuable resources are used effectively and left undamaged for the benefit of this and future generations. El Comité ProDefensa del Lago Gatún aboga por una ampliación realmente responsable y sostenible del Canal de Panamá que usa sus recursos valiosos efectivamente y los deja sin daños para el beneficio de esta y de generaciones futuras..

Go to http://www.crucestrail.com for more information on proven alternatives for the Panama Canal system expansion in English and Spanish. Visite http://www.crucestrail.com donde encontrará más información en español y en inglés de las alternativas comprobadas para la expansión del sistema del Canal de Panamá.

Questioning the Panama Canal Expansion Project's Compliance with Loan Stipulations

The purpose of this document is to address concerns with aspects of the Panama Canal Expansion where it is not likely to be in compliance with stipulations attached to loans it received from international banking organizations.

Foremost in this complaint is that – unless economically viable and appropriate technical changes are made in a timely manner – the present expansion plan will needlessly:

- cause permanent environmental damage, and
- introduce seismic risk that endangers third parties and the canal.

There are also major concerns with respect to the planned lock system's operational viability due to shortcomings inherent to its configuration, which will be very expensive, if even possible, to overcome once built.

A fundamental project development and engineering design process was inexplicably skipped at the outset, unavoidably leading to the project's ongoing problems. The standard engineering practice of identifying project challenges and developing designs to resolve them – considering all available elements, technologies, and operational techniques – never occurred.

While the chosen system uses up-to-date components, how those are combined results in new lock units that technologically predate the century-old Panama Canal's lock units.

In all instances the root cause of the risks this complaint exposes and describes is the seemingly arbitrary choice of lock system.

Environmental Damages: The Salt-Intrusion Issue

The position of this complaint is that what is being built for Panama Canal Expansion (PCE) project will:

- permit excessive salt to intrude into the transited lakes of the Panama Canal,
- create a migratory saltwater pathway across the Isthmus of Panama, and

- cause permanent damage to marine-ecology of two oceans.

This unacceptable outcome can be prevented using less risky, more efficient, lower maintenance locks that yield far greater returns.

While the locks chosen for this expansion were marketed as being “environmentally-friendly”, it is physically impossible for them to attain that status, given the way they are arranged and the way they must be operated to achieve the water-efficiency and ship-throughput needed to turn a profit.

The targeted water-efficiency and ship-throughput require these locks to transit ships in a specific sequence, which dictates how water – and the salt it contains – will move through the locks as the ships move. These physical actions cannot be wishfully altered.

Salt-Intrusion Today and Its Control

It is an observed and measured fact that salt intrudes through the locks of the present-day Panama Canal system into its “freshwater” lakes as ships are transited. Both Miraflores Lake and Gatun Lake of the Panama Canal contain quantities of saltwater.

Miraflores Lake – one step lower than Gatun Lake, and two steps above the Pacific Ocean at that entrance to the canal – serves as a barrier that virtually stops onward salt-migration. Today it contains a defined “deep layer” of saltwater overlain by “fresher” water. Despite the Cocoli and Pedro Miguel rivers flowing freshwater into it, Miraflores Lake became salty enough to force the Miraflores Water Filtration Plant's intake to be relocated to Gatun Lake fairly soon after the Panama Canal began operating.

Gatun Lake's “deep pool” of saltwater lurks in the flooded canyons of the Chagres River just above Gatun Dam, where saltwater that now intrudes through the three-step Gatun Locks settles. With the significant outflow of excess rain waters through that dam, salt that diffuses into the freshwater above that pool is actively removed.. Thus today, saltwater in Gatun Lake is not noticeable at shallower depths.

Salt will intrude through the lane of locks to be added by the PCE project as a result of the same physical process that is occurring every day as ships transit the existing Panama Canal's locks. How much salt intrudes is a function of lock arrangement and transit procedures followed.

The process that expels salt from the Panama Canal system will be overwhelmed by the expansion because:

- salt inflows will markedly increase,
- the Miraflores salt barrier will be bypassed, and the
- mitigation ability of the modified system will be significantly reduced.

The formation of a submerged corridor that sea creatures can use to cross the Isthmus of Panama is virtually being assured.

Ecological Consequences of an Unchanged Expansion Plan

Studies predict that the creation of a saltwater pathway between the Pacific and Atlantic Oceans will in all probability lead to disastrous encounters between differing species, bringing about the loss of some of these and the many known and unknown benefits they could offer the world.

A very recent example of how devastating the introduction of non-native sea creatures into a marine habitat can be is demonstrated by the disastrous escape of “lion-fish” into the Atlantic Ocean from a Florida aquarium as a result of Hurricane Andrew. This is not a trivial matter of no consequence. Lion-fish have spread up the eastern seaboard of the USA, into the Gulf of Mexico, and out to the Islands of the Caribbean, wiping out species as they've spread.

The report prepared early-on for the PCE project by Delft Hydraulics concluded that intruding salt would become a problem for the expanded Panama Canal unless it was adequately mitigated.

That report was replaced – in a move perceived by many as one designed to avoid delays in obtaining loans on schedule – by one more favorable. Conclusions similar to those of Delft Hydraulics, however, have been reached in other independent assessments.

I submit that the Panama Canal Expansion project – if it proceeds as planned – will cause unacceptable environmental damage, which can be avoided relatively economically by opting for better locks. I question how these environmental consequences can be in compliance with stipulations that accompany many of the bank loans the project has received.

Endangering Third Parties: The Catastrophic Seismic Risk Issue

Independent evaluations of this issue conclude that what is being built for the Panama Canal Expansion (PCE) project will knowingly and unnecessarily expose the canal to a high level of seismic risk that:

- threatens Gatun Lake with being catastrophically flushed to sea, and
- endangers all souls and businesses located to either side of the Pacific approach to the canal.

Creating the risk of such impacts to third parties and to this critical piece of world infrastructure must be wholly contrary to loan requirements, or certainly against their intent.

Miraflores Lake was included in the original Panama Canal specifically as a “sacrificial” lake to bridge seismically active faults that cross the Panama Canal. The present PCE project plans to bypass it. A dike along the west bank of that lake, running the length of it, is to be built across those faults. A new and elevated channel that links the new locks at the Pacific Ocean directly to Gatun Lake will be located behind the dike.

Should the faults under it slip and fail the dike, Gatun Lake will be lost and the Panama Canal will be shut down indefinitely.

Predictive Fault History

The faults beneath Miraflores Lake experienced major movements in the early 1600's and late 1800's, recorded first by the Spanish, then the French. Studies of those faults have determined that the earlier movement was greater by far than the latter one, and that movements like the larger tend to occur about every 400 years. If these findings are accurate, the strength of the dike now planned will be put to the test fairly soon after it is built.

A dike capable of withstanding the differential displacements recorded for these faults has never before been built. To attempt being the first to succeed at such a challenge by including one in the Panama Canal would not be prudent.

I submit that the lives and livelihoods of canal personnel, clients, and neighbors – along with the investment of Europeans and of other developed countries – are being needlessly threatened by the PCE project in its present form. I question how technical choices made in the name of expediency – disregarding lock systems that avoid this specific seismic risk entirely, more efficiently and economically – can be in the best interest of the canal and its investors.

General Design and Operational Shortcomings

This complaint focuses on the long-term negative impacts the Panama Canal Expansion (PCE) project will have on:

- future ship-handling costs and risks,
- water resource use and operational efficiencies.

All of these could be significantly improved if better locks were adopted, also benefiting future financial returns.

Ship-Handling

The PCE project plans to use tugboats exclusively for handling post-Panamax ships, maneuvering and guiding them through the lock steps. It is highly questionable how successful that mode of ship-handling will be.

Ships approaching today's locks are intercepted by tugboats. Towlines are hooked to special locomotives – known as mules – that will guide them through the locks once aligned by the tugboats. The mules move on rails installed atop the chamber walls that run the length of all of today's lock units.

Unlike locks in existence that can handle post-Panamax ships, the locks chosen by the PCE project are:

- too narrow to allow tugboats alongside those large ships, and
- too short for tugboats tied at bow and stern to adequately control the ships
- towline angles are too steep to allow full towing capacity,
- thruster-wash pushing against a ship being pulled is counterproductive, and

- crosswinds cannot be effectively managed.

Waiting until the system is cast in concrete – to "discover" whether or not handling ships with tugboats in this manner will work adequately – is unacceptable.

The lock design has apparently not contemplated any viable back-up plans, such as using:

- mules riding atop lock walls to handle ships, or
- rollers between ships and the lock walls.

It will be very costly – or impossible – to retrofit the locks for these alternatives.

Now is the time to fully assess this problem and take corrective action, not after the locks are built.

Efficiency

The PCE project plans to add one lane to the Panama Canal at this time, but plans for a "second" Panama Canal Expansion – to be initiated immediately following the first one – are already in progress.

From an investment point-of-view as well as a technical, environmental, ethical, social, economic and commercial one, it would be wholly unacceptable, foolish and financially irresponsible to pursue and fund a project that replicates the problems this complaint describes.

It is an ineffective use of limited resources, space and time to individually build two separate one-lane lock systems of identical design that are:

- much more expensive,
- far less efficient,
- riskier and less reliable
- permanently more damaging, plus
- require more watershed, affecting third parties, and
- curtail future expansion.

At a comparable cost, for the same water available, and in about the same amount of time, a well-planned two-lane system would be a far more sustainable, reliable and responsible alternative to the PCE project today and would provide for greater return-on-investment and future expansion potential. And, its construction could be phased to control up-front costs.

A Two-Lane Solution

Not only can a two-lane system increase transit capacity, it can be designed to incorporate a "sacrificial" lake for avoiding the risky faults, with that lake also serving to minimize salt-intrusion and to reduce the

amount of water the two-lane system uses to operate. Because of such a solution's greater efficiency, chamber sizes can be increased to improve the maneuverability of tugboats handling post-Panamax ships.

Any of the better two-lane alternatives would occupy no more real-estate than the one-lane locks with “water-saving tanks” chosen for the PCE project. Properly designed and operated two-lane locks without tanks would use less water. With effectively incorporated tanks, water-use could be reduced even further.

The single-lane system's risk of post-Panamax transits being delayed when any one chamber experiences a technical difficulty would be averted with two lanes. Critical maintenance jobs, best done with the lane involved shut down, would cause far less disruption with a second lane serving as backup.

The simplest two-lane system – costing about the same to build as the one lane now planned – would transit up to 22 ships a day. It would consist of 4 enlarged copies of the proven Pedro Miguel Locks of today's Panama Canal. By comparison, the one-lane system proposed for the PCE can manage no more than 14 transits daily, each using 13% more water than transits of the simplest two-lane system.

Maintenance of a two-lane system would be dramatically less than for the PCE's single lane. For example, key equipment – such as gates and valves – would only be operated half as often to complete a transit.

The two lanes would occupy no more right-of-way than what the single lane with its side tanks will use.

Salt-intrusion would be perfectly controllable with two-lane systems, whereas with the system now planned will lead to the environment being damaged.

Should the current PCE project proceed unchanged, the Panama Canal's future potential will be irrevocably truncated. With the first single-lane's success already in doubt, success of its twin is even more questionable.

In my professional judgment – as an engineer, a taxpayer, and an advocate for the rights of others whose money is also being extended in loans to the project – lock construction for the Panama Canal Expansion project should not move forward without the issues raised in this complaint having been thoroughly assessed and resolved.

Conclusions

It is a tribute to the skills employed by its promoters that the Panama Canal Expansion (PCE), a project with high financial risks – that threatens the environment with its outdated lock selection and is essentially devoid of technical substance – was considered acceptable by banking organizations and government officials seeking sustainability across the globe.

On the basis of physics and scientifically determined fact, the PCE project in its present form will undoubtedly increase salt-intrusion into the waterway and reduce mitigation, which will lead to irreversible environmental damage.

Long-term measurements show a small, but steady, rise in Gatun Lake's salinity despite existing mitigation processes at work. Today's expansion project, unless modified, will cause that rate to increase dramatically.

The PCE plan also requires bypassing Miraflores Lake by building a dike across faults with an historical record of cyclical ruptures. That risks losing Gatun Lake and everyone and everything from Miraflores Lake out to the Islands of Amador.

It is very doubtful that anyone financing this project would consider a shutdown of the Panama Canal for years an acceptable design “side-effect”, especially when superior locks of comparable cost could be built instead that would provide better service and reliability, and be more efficient, easier to maintain, and less complicated to operate.

Considering what has be found by looking “under the rug”, PCE project-related statements recently published in the WikiLeaks – attributed to Panama's current President and Vice-President, who questioned it while qualifying it as a “disaster” – might more appropriately be called the “understatements of the new millennium”.

It is alarming to witness, what I – as an expert in the field of engineering – can only perceive as out-of-control fiscal irresponsibility flourishing in a financial system that is not enforcing the checks-and-balances that obligate its appointed officers to defend the best interests of its investors.

At the moment, the appearance is that the loan process has been corrupted.

This is an appeal for relevant terms in the loan agreements to be invoked and for appropriate corrective actions to be taken. It would be incomprehensible not to do so in light of the realities being exposed regarding the Panama Canal Expansion project. Not gambling on unproven technology is reasonable, but paying to downgrade the Panama Canal's future by incorporating old technology very poorly is absolutely unacceptable.

It is still unquestionably possible to transform the Panama Canal Expansion into a profitable and sustainable venture.

To do less – needlessly exposing the Panama Canal and marine-life in both oceans to catastrophic risks while using it in what many perceive as a sophisticated wealth transfer scheme – would be a crime and a step backward for mankind.

Bert G. Shelton, PE --- 24 March 2011