

## **Diamer Basha dam: Have a heart Chairman Sahib, we love Pakistan**

Diamer Basha Dam (DBD) is a large dam in the Indus Cascade. It has a vital function for sediment control to facilitate three downstream run-of-river hydro power projects (Dasu, Pattan & Thakot with power rating 11,200 MW) to operate sediment free. DBD has a minor role in flood control as at this location (Chilas) the average flow is 50 MAF/a. In this respect the flood control prospect of the Kala Bagh Dam (KBD) is much greater as its flow is averaging 94 MAF/a. Irrigation canals from DBD are not possible. In 1984 the critical Pre-Feasibility was completed by MONENCO Canada under supervision of the world famous Geotech Engr & Geophysicist; Late Lt. Gen (R) Dr. Ghulam Safdar Butt, WAPDA Chairman 1981-7. Type of dam; **Concrete Faced Rock Filled (CFRD) a Non-Rigid dam with high earthquake resistance.**

Water Resource Development Council (WRDC) was convened by Engr. Suleman Najib Khan under guidance of Lt. Gen (R) Dr. G. S. Butt & Prof. Dr. Kazi Ainuddin Ahmed. Efforts made to highlight the financial meltdown due to the 1994 Thermal IPP Policy based on imported energy were documented. The Electric Power Forum (EPF) setup for similar purpose in 1995. Members included Lt. Gen (R) Dr. G. S. Butt. CJP (R) Nasim Hassan Shah was Chairman EPF in 1997. WRDC had convened under the guidance of Lt. Gen (R) Dr. G. S. Butt & Maj. Gen (R) Fazle Raziq the watershed international event "Conference on Water Reservoirs in the National Economy" at Islamabad on 9 Feb 1998. Invitation to WRDC extended by Minister of Water & Power Maj. (R) Nadir Pervez. WRDC convened several dozen workshops, discussions & lectures for the next 12 years for civilian & military audiences. Engr. Khan was Co-Chairman of Pakistan Business Council (PBC) Water Panel Report in 2013 (PEF-II) & Chairman in 2015 (PEF-III). These national reports were prepared with the involvement of Dr. (Hon) Shams ul Mulk & Engr. Sardar Mohammad Tariq.

WRDC wrote on 25 Jan 20 its 2<sup>nd</sup> letter (IWA-20) in 15 months on DBD to Chairman WAPDA but ignored. WAPDA announced evaluation results on 5 March 20. WRDC sent its Complaint letter to PPRA on 12 March 20 pointing out that the "evaluation" is not based on competitive bidding. WAPDA recommended award of Main Civil Works MW-1 at PKR 442 Bn to a single bidder 52% above approved PC-1 value PKR 290 Bn. WAPDA links cost increase for civil works with PKR devaluation which is not rational. It is our conviction that tallest RCC dam built without a "Design Review" will impact our defense capability & economy. WAPDA Chairman states that objection to WAPDA evaluation are acts of vested interests against Pakistan. WRDC has worked +25 years with a single objective i.e. to reduce the dependence on imported energy (in Power Sector) and revive the Hydel : Thermal of 70:30 which after the IPP 1994 Imported Energy Policy became lop-sided. We invite the educated people of Pakistan to visit our website [www.wrdc.com.pk](http://www.wrdc.com.pk). **DBD is an existential issue.** Our point wise rebuttal of the above insinuation is our patriotic duty:

- 1) MONENCO Pre-Feasibility (1984) outlines a 660ft (201m) CFRD. Vision 2025 at pg 80A confirms this. Hazardous site conditions & seismic situation allow a lower Non-Rigid rock fill CFRD structure.
- 2) NEAC JV Feasibility Report (2004) switched to a Roller Compacted Concrete (RCC) dam 272m above rock bed; **the tallest RCC Rigid dam on the planet** ignoring the seismic history of site & reservoir location on Central Asian fault-line. WAPDA concealed this switch. Gen. Dr. Butt reacted very strongly. Between June & Nov 2004 wrote three memos to President Musharraf protesting the design change. Covering note of first memo (2 June 04) attached. **Safety of a high RCC structure his great concern.**
- 3) Gen. Dr. Butt called it a reckless move. Sketch below is an outline comparison of both designs.
- 4) He led a delegation to meet Chairman Tariq Hameed on 30 June 2004. He expressed his disgust with NESPAK actions & callous acts of the Panel of Experts (POEs) who approved the Feasibility. He was disappointed by the presentation and wrote a strong five pager to Chairman Tariq Hameed on the

same day (30 June 2004.) Included in Chapter-15 of the PBC Water Report; as part of the website [www.wrdc.com.pk](http://www.wrdc.com.pk). Dr. Butt was 100% accurate with both concerns. On 08 Oct 2005 the major earthquake in GB/NA & the 13 May 2008 seismic disaster in Sichuan, China caused by the reservoir location on a fault line should have convinced all concerned to revert to CFRD. Reservoir induced earthquakes are a reality. Report on DBD issued by Directorate of Seismic Studies on 20-01-2017 reports 732 seismic events recorded within 250km radial distance from DBD in the period Aug 2016 through Dec 2016. Five events are above 4.0 mag for which the PGA can be calculated at DBD site.

- 5) Gen. Dr. Butt saw this design switch a move to eliminate KBD; under pressure of Sen. Nisar Memon.
- 6) Gen. Dr. Butt was convinced that a CFRD dam (220m) will be safe & can be built in less than half cost of the proposed RCC structure as it would utilize the enormous granite available around the DBD site. There are hidden costs as RCC design will involve transportation of enormous quantities of cement, steel, sand & other inputs which is expensive as well as a severe burden on the existing KKH; requiring several years for up-gradation (gentler gradients, wider & protected with rock bolting & meshing.) The smaller structures e.g. Dasu HPP are not tall dams. They can be built safely as RCC structures.
- 7) Lahmeyer Consultant completed Detailed Design & Tender docs around 2010 based on RCC Rigid dam design. WRDC rejects the RCC tallest dam in the world at DBD as an extremely destructive & financially crippling project. River bed is at 3,182 ft asl. It can be built rapidly as a safer CFRD, in half the cost.
- 8) Dr. (Hon) Shams ul Mulk, our great civil engineer at para d) of the Technical Committee Report (2005) shows great concern with the statement “Basha RCC option is with a height of 908 ft in active seismic region. A dam of 600 to 650 ft on the other hand would create substantial multi benefits without creating discomforts about its sustained safety. **Pakistan needs a facility and Not a Monster.** No RCC dam of even lesser or comparable height has so far been built in the world under such unfavorable conditions.” In para g) of the report the Technical Committee 2005 demands “intensive & extensive investigations over a substantial period to make it safe & bankable project to acceptable & recognized international standards. The need is for a greater degree of caution before launching the project.”

An outline comparison of both designs of DBD:

| Sr. # | CFRD (Concrete Faced Rock Fill)   | RCC (Roller Compacted Concrete)   |
|-------|---|---|
| 1     | <b>Basics</b><br>*<br>Non-Rigid (220m) above river-bed<br>Rock core, Wide base, Lower structure using local area rock fill. | Rigid (272m) above <b>bed-rock</b><br>Light RCC. Tallest RCC in the World. Taller than Longtan (2009) 216.5m. Gilgel Gibe III (2015) 243m |
| 2     | <b>Reservoir Capacity</b><br>7.3 MAF gross / 5.7 MAF live.<br>Crest elevation 1170m asl                                     | 8.1MAF gross / 6.4MAF live.<br>Crest elevation 1170m asl  |
| 3     | <b>River bed</b><br>Excavation not Required   | Excavation Required   |
| 4     | <b>Time</b><br>Less than 10 years   | +15 years   |
| 5     | <b>Cost</b><br>Less than USD 7bn  | + USD 15bn  |
| 6     | <b>Power Rating</b><br>3400MW + 1800MW (Raikot HPP)   | 4,500 MW (Raikot is not possible due to a high RCC)   |
| 7     | <b>KKH</b><br>Nominal upgradation   | Extensive upgradation   |
| 8     | <b>Seismic</b><br>High Resistance to Earthquakes  | Poor Resistance to Earthquakes  |

\*River-bed 3182 ft asl and not 3116 ft asl of original survey.

## 15. THREE LETTERS OF LT. GEN. (R) DR. BUTT TO President MUSHARRAF. ONE TO WAPDA'S CHAIRMAN

Three unedited letters written by Dr. Butt to President Musharraf in 2004. One hard letter written to WAPDA Chairman, Mr. Tariq Hameed within a few hours of our delegation's visit.

### 15.1 Three letters of Lt. Gen (R) Dr. G. S. Butt to Gen. (R) Musharraf (2004)

Lt Gen G S Butt

10-A, TECH Society, New Campus,  
Lahore-54590, Pakistan.

2<sup>nd</sup> June 2004

General Pervez Musharraf,  
President of Pakistan,  
ISLAMABAD

You are soon going to decide on the next dam to be built. My loyalty demands, that being a senior engineer, I express my views to you.

Please scan the next three pages. I have deliberately avoided talking about Basha located in seismic zone. I was involved in Pattan earthquake – repair of KKH and relief to the affectees. I shudder at the thought of earthquake effects on Basha. Dam-burst would wipe out Tarbela and all barrages on Indus; which would put us back to stone-age.

I have also talked to the Chairman WAPDA about these issues. I do not agree with their consultants, who would make their money and walk away, leaving the problem in our lap, like they did to us in case of Tarbela.

Fond regards.

Yours very Sincerely,



Lt. Gen. G.S. BUTT (R)

Copy forwarded:

1. Chairman WAPDA, WAPDA House, Lahore
2. Mr. Wasim Khan.
- ✓3. Mr. Suleman Najib Khan,
4. Mr. Mazhar Ali