



Industrie Service

WCD Compliance Report

“Xiaoxi Hydropower Project
Hydropower Station”

Report No. 1051208

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Industrie Service



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<p>Summary:</p> <p>TÜV SÜD Carbon Management Service has been ordered by RWE Power AG in Essen, Germany, to assess the compliance of the project "Xiaoxi Hydropower Project" in China against the requirements of the World Commission of Dams (WCD).</p> <p>This compliance assessment has been performed by document reviews, an audit at the location of the project and interviews with the project owner, its technical advisors, local authorities and affected stakeholders.</p> <p>The need for corrective action requests (CAR) and the proposal of later verification activities (VP) is described in the report and the attached compliance protocol.</p> <p>The WCD guidelines are very demanding and have to be seen in some cases more as goals than concrete requirements. Taking this into consideration we defined 2 clarification requests (CR1 – CR2) which should be resolved. Additionally we defined 4 verification proposals (VP1 - VP4) where we propose future verification. Under the pre-condition that the open CRs have been resolved we can confirm as result of our compliance audit that the Xiaoxi hydropower plant complies in all essential strategic priorities with the WCD guidelines. This is particularly true for the core aspects</p> <ul style="list-style-type: none"> • directly affected stakeholders have not been socially or culturally disadvantaged • there is no negative impact on the river, the livelihood and the environment in general. 				
Munich, Jan. 22, 2008		Munich, Jan. 22, 2008		
 Werner Betzenbichler Head of Carbon Management Service		 Dr. Sven Kolmetz Project Manager		
Work carried out by Dr. Sven Kolmetz and Carl Zhou				

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Appendix 1: Compliance Protocol

Appendix 2: Information Reference List



INTRODUCTION

1.1. Objective

RWE Power AG, based in Essen, Germany, has commissioned TÜV SÜD Industrie Service GmbH (in short: TÜV SÜD) to assess the compliance of the Xiaoxi hydropower plant in the province of Hunan, China, against the guidelines defined in the report of the World Commission on Dams (WCD). The assessment scope is defined as an independent and objective review of the present status of the hydropower plant project. TÜV SÜD has, based on the WCD report, employed an approach which encompasses all WCD requirements but sets special focus on the most relevant aspects.

The assessment is not meant to provide any consulting towards RWE Power AG. However, stated requests for corrective actions or verification proposals may provide input for improvement of the project design / realisation.

1.2. Description of Hydropower Plant

The Xiaoxi Hydropower Project is located in the midstream of Zishui River in Xiaoxi Village, Pingshang Town, Xinshao County, Shaoyang City, Hunan Province, P.R. China.

The main objective of the project is to generate power from clean renewable hydro power in Hunan Province and contribute to the sustainability of power generation of the Central China Grid.

The Project is a run-of-the-river hydropower plant with a total installed capacity of 135 MW. It includes three sets of 40 MW turbines and one set of 15 MW turbine and associated generators which are made in China. The average annual operating hours are 3730 hours. The Project is designed to deliver discharge flow of 812.62 m³/s with 19 m of water head and 47m of maximum dam height. The normal water level of the reservoir is 198 meters above the sea level; the corresponding reservoir capacity is 1,412,000,000 m³. Near the dam a boat gate with the capacity of 1 million ton will be built. It can improve the upstream shipping-conditions within 38 km. It is estimated that the feed-in electricity to the Central China Grid is approximately 503.5 GWh per year. All the electricity generated will be delivered to the Central China Grid via two 110 kV outlet circuits.

An Environmental Impact Analysis (EIA) is needed for such large hydropower stations. An Environmental Impact Assessment (EIA) was carried out and was approved by the Hunan Province Environment Protection Bureau on April 29 2005.

The European linking directive requires an assessment according to WCD guidelines for all hydropower plants with a capacity of 20 MW or more. Large dams are defined as dams with a height exceeding 15 m. Hence, the Xiaoxi project clearly has to be investigated according to the WCD requirements.

1.3. Key data of the power plant project

The following data will show some absolute and relative numbers concerning the benefits and the possible disadvantages of the power plant. The relative criteria will be used to allow comparison of different projects. Over time, this will lead to a data base allowing to set minimum / maximum values for WCD projects.

		absolute	Relative
1	Energy production of hydro power plant (net per year)	<value in MWh> 503.500	Impact of the additional energy production calculated as “percentage of the absolute energy production of the power plant versus the energy production within the relevant grid / sub-grid” 1,3%
2	Flooded area (total / tillable land)	<value in km ² > total: about 1.32 tillable: 1.005	<total flooded area / yearly energy production in m ² /MWh> <flooded usable land / yearly energy production in m ² /MWh> total: 2.62
3	Resettled people	<total number, from baby to senior> 7 563	“resettled people / yearly energy production” in number/GWh 15
4	River flow affected upstream / downstream	<value in km> up: 47 down: 12	Impact of the dam onto the free river flow based on number and position of other dams / weirs by which the river is dammed up within the next 50 kms. -

1.4. Assessment Schedule

The compliance assessment took place May 28 – 29, 2007.

The auditing team consisted of:

Carl Zhou

Jiangsu TUV Product Service Ltd., Shenzhen Branch

More details and the supporting information can be found in the “Information Reference List” in appendix 2.

ASSESSMENT FINDINGS

In the following sections the findings of the compliance assessment are stated. They are presented as follows:

- 1) The findings from the document review and from interviews summarised, categorized according to the 7 “strategic priorities” of the WCD report. A more detailed record of these findings can be found in the Compliance Protocol in Appendix 1.
- 2) Where TÜV SÜD had identified issues that represented a risk to compliance with the WCD report, a Corrective Action Request (CAR) or Clarification Request CR has been issued. According to our assessment non-fulfilment of such a request endangers WCD-compliance.
- 3) Where TÜV SÜD had identified issues or open questions that have to be resolved at a later time to achieve or maintain compliance with the WCD report, a Verification Proposal (VP) has been issued.
- 4) The conclusions of the determination are presented consecutively.

2.1 Gaining Public Acceptance

2.1.1 Findings

According to the approval of the planning and design report for the resettlement and the occupied land due to the proposed project, approved by the Hunan province people’s government on Jan. 15 2006, there are 41 villages involved in total. Twenty of these villages involve resettled people; the other villages are only affected by flooded lands.

In the planning and its approval the affected stakeholders were clearly defined based on a river-basin wide survey of relevant social, economic, and environmental values, requirements, functions, and impacts.

Stakeholders have been identified. Apart from the project owner and the local / regional government the obvious stakeholders for operational issues are the villages affected by the project.

The project owner and the local government took part in the decision process of the project. Other stakeholders (local people) knew about the project in the early stage of FSR and were informed about the project in more detail in the survey stage regarding occupied lands and resettlement of the FSR in 2004.

The concerned villagers and their leaders were not involved in the decision process. According to our information the project owner negotiated the project with the provincial and regional government. This is a deviation from several guidelines of the WCD report.

On the other side, as outlined in section 1 and 2 of the protocol, all affected people considered the entire project very positive and they all have improved their living environment. As the core requirement of “no social or cultural disadvantages” has been achieved the essence of the WCD guidelines is still fulfilled. On the other side the affected people have improved their living environment. As the core requirement of “no social or cultural disadvantages” has been achieved the essence of the WCD guidelines is still fulfilled.

When the migrating people don't agree the survey results, they can argue the issue with the resettlement bureau. Furthermore they can reflect their issues to the local government. The local government and the resettlement bureau will help them to resolve the issues.

The following measures were implemented to gain public acceptance:

- Improving the local traffic condition through re-building a road and building a new road with 7.5km from Yiwutang village to Xiaoxi village.
- Increasing the employment possibilities for the local people.
- Building a water supply system for more than 1000 local people.
- Building 4 small towns for the resettled people including water supply, electricity supply and road.

2.1.2 Issued CARs / VPs

No CARs / VPs have been issued.

2.1.3 Conclusion

Even if the WCD guidelines 1 – 3 have not been literally fulfilled, public acceptance has been achieved and we consider therefore the result as compliant with the WCD approach.

2.2. Comprehensive Options Assessment

2.2.1. Findings

The Chinese electricity production is mainly coal-based and the Central China Power Grid (CCPG) has therefore high CO₂ emissions of 1.2526 tCO₂e / MWh (according to NDRC values for calculating baseline emissions of CDM projects). The growth of the Chinese economy leads to even more coal-fired power plants. On national level renewable energies are therefore seen as a very important resource to limit emissions. Hydro power is the most important segment of renewable energies in China, and the national Chinese energy strategy promotes hydro power production. Even if the production of the power plant covers only 1.3% of the consumption of the province of Hunan, the combined output of medium sized hydro power plants can be considered as one important part to a cleaner electricity production in Central China.

As explained in the protocol, different documents have covered the local aspects in detail and analysed all important aspects. No negative consequences were found or measures were imposed to the project owner to improve the situation. The detailed in-depth approach as outlined in the WCD-guidelines 4 – 11 has not been applied on a regional or even local level.

2.2.2. Issued CARs / VPs

No CARs / VPs have been issued.

2.2.3. Conclusion

The hydropower plant feeds into the high-voltage grid of Central China and decisions were oriented towards the country-wide market, not towards the local supply. All option assessments refer therefore to the national level. There is no doubt that medium-sized hydropower is one of the most preferred options for China. Therefore we consider this strategic WCD priority as fulfilled, even if the WCD guidelines 4 – 11 have not been literally covered.

2.3. Addressing Existing Dams

2.3.1. Findings

The safety level on Chinese construction sites does not necessarily correspond to international or even European standards. As the plant is not yet in operation details could not yet be checked. But a monitoring system about dam safety has been established by the project owner. The documents: the 23rd monitoring report, the precaution and prevention plan for flood in 2007 (defined according to the national standard), the preservation program for soil and water have been provided to the assessment team.

Through the system they want to ensure dam safety in the construction and operation period. According to the monitoring system the operator defined the warning system for risk situations, in compliance with the precaution and prevention plan for flood in 2007.

The approval of the earth-quake safety assessment report of the project has been given in March 2007 by Hunan province earth quake bureau.

The final acceptance of the built dam before commissioning will be executed by the quality evaluation centre of the water resources office of the province of Hunan. This acceptance checks have not yet been carried out. During the operation phase, the dam will be checked periodically by the qualified authorized dam safety management committee from hydro power department in Hunan province.

As the dams are still in their construction phase no operating rules exist up to now. At present no need can be seen for such agreements.

2.3.2. Issued CARs / VPs

None

2.3.3. Conclusion

The project complies with WCD-guidelines 12 and 13.

2.4. Sustaining Rivers and Livelihoods

2.4.1. Findings

According to the feasibility study report and its approval, there are 3 options for choosing the dam location considered. Through comparing with the geographic status, environmental impact,

ecosystem impact, resettlement and occupied lands of the options the optimized option was defined.

The FSR was written by the state water power department Hunan province survey and design study institute. It was approved by the hydro power department in Hunan province. The institute is a professional and qualified hydro power design and research institute.

According to the state regulations the EIA should be implemented by the qualified environment impact assessment institute and approved by the authorized environment protection department before starting to construction.

So these regulations can ensure that the consideration of options have been taken into account: avoiding dams on the main-stem of rivers wherever possible; avoiding or minimising negative impacts on endangered species, ecosystems, livelihoods, human health and cultural resources; and respecting the provisions and guidance of relevant international treaties.

The relevant materials have been provided to the audit team and were reviewed by the audit team on site.

As there are already two hydro power plants along the river, the Shaigutan hydro power station 47 km upstream and Liangshitan hydro power station 12 km downstream, there is no free flow of the river. Thus the impact of the new Xiaoxi hydropower station on the river basin is limited.

The environmental aspects have been considered in the feasibility study report (FSR), the EIA and the water & soil conservation document.

According to the contract of Xiaoxi hydro power infrastructure construction the detailed environmental protection actions (monitoring and evaluation programmes) during construction period have been defined.

According to the approval of EIA the environmental safe minimum flow is defined as 50 m³/s, which can ensure ecological and agricultural water-usage demands downstream. The project design documents prove that the environmental flows have been considered and after operation of the project the flows can be ensured by the design and operation procedure.

The local official from the Environmental Protection Bureau (EPB) confirmed that during the construction period, the local environmental protection bureau implemented periodical inspections for the water quality, air quality and noise etc. But they did not publish any formal report as there were no negative findings.

When the project starts commissioning, the EPB will check and accept the project. At that time they will publish a formal report. After operation of the project, the EPB will check the environment quality status periodically per year.

Before reservoir filling the project operators has to completely clean the area of the reservoir which will be flooded according to the requirements of the area of the reservoir cleaning regulation for the hydro power engineering. The requirement is stipulated in the approval of the EIA.

The regulations for commissioning, operation, emergency drawdown and decommissioning have been stipulated in the following state regulation: Precaution and Prevention of floods, legal safety management regulation of reservoir and dams, the authorization regulation for safety of reservoir and dams.

According to the requirements of the above mentioned regulations, the authorized department for precaution and prevention of floods is in charge of the management of precaution and prevention of floods. The hydro power department is in charge of management of dam safety.

The legal requirements of the state regulations have been considered by the project owner when defining the precaution and prevention of floods program in 2007 during the construction period, the monitoring and measurement system for the safety of the dam for the construction

period and the preservation program of soil and water. These documents have been reviewed on site by the auditor.

2.4.2. Issued CARs / VPs

Clarification Request 1:

As the approved capacity of the project is 120MW according to the approval of the EIA, please provide more evidence to demonstrate that the installation capacity of 135 MW of the project can be accepted by the authorized environmental protection department and that the environmental impacts and the environmental safety of the project are sufficiently taken care of:

- A formal statement by the responsible authorities is needed whether the existing EIA is approved even if the capacity of the plant has been increased.
- Alternatively a new EIA has to be produced, representing the scope of the plant as it will be built, and has to be approved by the responsible authorities.

Response:

The project owner has submitted the required document.

Verification Proposal 1:

We propose to check the formal acceptance report published by EPB after the first year of operation of the power plant.

Verification Proposal 2:

As the project is still under construction, the project owner didn't define the relevant commissioning, operation management regulations of the proposed project according to the state regulations, we propose to check if the regulations have been defined or implemented after the first year of operation of the power plant.

2.4.3. Conclusion

Since CR1 has been resolved by delivering the requested confirmation the project complies with the WCD approach (guidelines 14 – 16).

2.5. Recognizing Entitlements and Sharing Benefits

2.5.1. Findings

Village leaders and interviewed villagers agreed that the hydropower plant will bring many advantages and that therefore everybody supports its construction. This has been already proven by questionnaires survey for the local stakeholders affected by the project from Aug. to Oct. 2006. By constructing of the project there are benefits for the local residents as described in chapter 2.1.1.

According to the approval of the planning and design report for the resettlement and the occupied land of the proposed project, there are totally 7 593 people affected, most of them are farmers, some of them are citizens. The total residential area affected amounts 315,144.3 m², farm land area 1.005 square km and the total compensation is 263,613,700 RMB.

The whole resettlement process is described as follows:

The survey for the affected people and villages during the FSR writing in summer 2004 confirmed how many people will be affected and how much land area will be occupied and flooded. This survey was implemented by Hunan province survey and design institute for water power. After finishing the survey the institute defined the planning design report of occupied lands and resettlement of the project in 2005. On Jan. 15, 2006 the Hunan province people's government approved the planning design report.

Before construction of the project the project owner, the local resettlement bureau, the local people affected, the local land bureau and Hunan Xiangyi resettlement supervising company have implemented a survey to precisely investigate each individual case in depth. This includes investigation of the concrete houses area and occupied land area of each resettled individual or family. After the survey the migrating people will sign a resettlement compensation agreement with the project owner and the local resettlement bureau. When the migrating people don't agree with the survey results, they can argue the issue with the resettlement bureau. Furthermore they can reflect their issues to the local government. The local government and the resettlement bureau will help them to resolve the issues.

According to the agreement the affected people will get the relevant compensation from the project owner during the stages of construction. The process will be supervised by the mitigation bureau and the Hunan Xiangyi resettlement supervising company, which is a private company, and is thus a independent Third party.

During the onsite visit the project owner provided the resettlement compensation agreements and the supervising monthly report of resettlement compensation work from April to the assessment team.

Compensation aspects for above mentioned affected areas were carefully investigated by the assessment team. The entire area is village property; no private persons have usage rights in the area affected. Compensation for the flooded and permanently used area will therefore go directly to the village at first and then to individual people. The compensation agreements for the occupied lands have been signed between the village commissions and most of the affected people.

Some villagers were randomly interviewed on the road or in their homes, without presence of any official authority. The villagers confirmed that they have been informed on the applicable laws and on the process. Some of them who have been affected or were presently affected due to the construction of the project have received compensation from the village commissions according to the signed compensation agreements. Others will get their compensation when they will be affected due to the construction of the project. The affected people are basically satisfied with the compensation results. Because some compensation will be based on the actually flooded / built area (to be finally determined at the time of commissioning the plant), some people did not yet know the total compensation. But they knew the compensation standard from other compensated people. The plan of the village commission is to utilize some compensation from the village property to invest it into communal infrastructure.

Other benefit sharing agreements besides the one described above are not planned; additional agreements or measures deem however not needed according to the understanding of the assessment team.

The relevant documentation such as the EIA and EIA approval were made available for the local people affected.

The concerned villages and even more the concerned farmers were not involved in the decision process and only informed when decision had been taken already. The relevant documentation

was made available to them, but was not easily to access due to the bad traffic conditions, bad communication conditions and low level of education of the local people. This is a deviation from several guidelines of the WCD report.

But as all affected people considered the entire project very positive neglecting this aspect did not lead to any negative consequences. We conclude that in this case despite of the violation of some WCD guidelines the more important effect (“no social or cultural disadvantages”) has been achieved and that therefore the essence of the WCD guidelines is still fulfilled.

2.5.2. Issued CARs / VPs

Verification Proposal 3:

As the compensation work is not yet finished, the net results of compensation therefore could not yet be verified against Chinese laws and the potential disadvantages for villagers. We propose to check compensation aspects again after the first year of operation of the power plant.

2.5.3. Conclusion

Guidelines 17 – 20 can be seen (besides guidelines 14 – 16) as the heart of the WCD recommendations. We consider the Xiaoxi power plant to be compliant with these essential WCD requirements.

2.6. Ensuring Compliance

2.6.1. Findings

Compensation payments are mentioned in the approved feasibility study report and the approved preliminary design report.

According to the provided supervising monthly report in April the compensation payments have been paid 196,750,000 up to April. The whole resettlement and compensation work is expected be finalized before the end of Oct. 2007.

As the compensation work is not finished now, we propose to check the aspect after 1 year of operation of the project.

According to the support policy during operation stage of hydro power station for the resettled people due to reservoir flooding, dated July 1 2006, the resettlement people can receive 600 yuan per person per year for a period of 20 years. The provincial government will establish a support fund. The capital of the fund will be collected from sale of electricity of different power plants. The provincial government will control and distribute the money to the resettlement people.

As the project is in its early phase of construction and will become operational only in the second half of 2007 this aspect could not be checked during the on-site visit.

The requirements postulated in the EIA, the water & soil conservation program and the river basin program will be checked by the respective local authorities.

2.6.2. Issued CARs / VPs

Verification Proposal 4:

We propose to check realisation of benefit sharing mechanisms and mitigation and development measures after the first year of operation of the power plant.

Clarification Request 2:

Dependent on the scope of future changes of the power plant feasibility studies may be required by law. But no explicit commitment by the project owner exists covering this aspect. The project owner has to present a written commitment to undertake a feasibility study for any major physical change including the influence of climate change.

Response:

The project owner has submitted the required document.

2.6.3. Conclusion

The existing Chinese resettlement and compensation concept realizes many of the recommendations of guidelines 21 – 25 of the WCD report. But in this project phase it could not yet be confirmed that all aspects will be carefully and completely fulfilled.

We therefore propose 1 CR, to be resolved on short term, and 1 VP, to be checked after the first year of operation. To the extent to which a compliance statement is possible in this phase we can confirm that under those conditions the project complies with the “Ensuring Compliance” guidelines of the WCD report. The CR has been resolved.

2.7. Sharing Rivers for Peace, Development and Security

2.7.1. Findings


The project is located in the middle stream of Zishui river. Zishui river is running through Hunan province only. There are no transboundary effects as there are no international borders nearby.

2.7.2. Issued CARs / VPs


There are no CARs / VPs

2.7.3. Conclusion


We consider the power plant as compliant with the WCD approach (guideline 26).

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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
<p>World Commission on Dam Requirements for hydro projects with a generating capacity exceeding 20 MW.</p> <p><i>The validator should ensure that the following relevant criteria from the World Commission on Dam’s 2000 report have been taken into account.</i></p>					
<p>I PART I: ASSURE THAT THERE ARE NO DISADVANTAGES TO PEOPLE AND THE ENVIRONMENT</p>					
<p>1.1 Strategic Dimension 4: Sustaining Rivers and Livelihoods <local></p>					
1.1.1 Does an established policy exist to maintain selected rivers with high ecosystem functions and values in their natural state?	4, 5, 10, 14, 15	1,2, 3,4, 5,6, 8	<p>The Xiaoxi Hydropower Project is located in the midstream of Zishui River in Xiaoxi Village, Pingshang Town, Xinshao County, Shaoyang City, Hunan Province, P.R. China.</p> <p>The main objective of the project is to generate power from clean renewable hydro power in Hunan Province and contribute to the sustainability of power generation of the Central China Grid.</p> <p>The Project is a run-of-the-river hydropower plant with a total installed capacity of 135 MW. It includes three sets of 40 MW turbines and one set of 15 MW turbine and associated generators which are made in China. The average annual operating hours are 3730 hours. The Project is designed to deliver discharge flow of 812.62 m³/s with 19 m of water head and 47m of maximum dam height. The normal water level of the reservoir is 198 meters above the sea level; the corresponding reservoir capacity is 1,412,000,000 m³. Near the dam a boat gate with the capacity of 1 million ton will be built. It can improve the upstream shipping-conditions with 38Km. It is estimated that</p>	CR1	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
			<p>the feed-in electricity to the Central China Grid is approximately 503.5 GWh per year. All the electricity generated will be delivered to the Central China Grid via two 110 kV outlet circuits.</p> <p>An Environmental Impact Analysis (EIA) is needed for such large hydropower stations. An Environmental Impact Assessment (EIA) was carried out and was approved by the Hunan Province Environment Protection Bureau on April 29 2005.</p> <p><u>Clarification Request 1:</u></p> <p>As the approved capacity of the project is 120MW according to the approval of the EIA, please provide more evidence to demonstrate that the installation capacity of 135 MW of the project can be accepted by the authorized environmental protection department and that the environmental impacts and the environmental safety of the project are sufficiently taken care of. I.e.</p> <ul style="list-style-type: none"> – <i>A formal statement by the responsible authorities is needed whether the existing EIA is approved even if the capacity of the plant has been increased.</i> – <i>Alternatively a new EIA has to be produced, representing the scope of the plant as it will be built, and has to be approved by the responsible authorities.</i> 		
1.1.2 Did consideration of options take into account: avoiding dams on the main-stem of rivers wherever possible; avoiding or minimising negative impacts on endangered	4, 5, 10, 14, 15	1,5, 6,8	<p>According to the feasibility study report and its approval, there are 3 options for choosing the dam location considered. Through comparing with the geographic status, environmental impact, ecosystem impact, resettlement and occupied lands of the options the optimized option was defined.</p> <p>The FSR was written by the state water power department Hunan province</p>	☑	☑

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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
species, ecosystems, livelihoods, human health and cultural resources; and respecting the provisions and guidance of relevant international treaties?			<p>survey and design study institute. It was approved by the hydro power department in Hunan province. The institute is a professional and qualified hydro power design and research institute.</p> <p>According to the state regulations the EIA should be implemented by the qualified environment impact assessment institute and approved by the authorized environment protection department before starting to construction.</p> <p>So these regulations can ensure that the consideration of options have been taken into account: avoiding dams on the main-stem of rivers wherever possible; avoiding or minimising negative impacts on endangered species, ecosystems, livelihoods, human health and cultural resources; and respecting the provisions and guidance of relevant international treaties.</p> <p>The relevant materials have been provided to the audit team and were reviewed by the audit team on site.</p> <p>But see CR 1.</p> <p>As there are already two hydro power plants along the river, the Shaigutan hydro power station 47 km upstream and Liangshitan hydro power station 12 km downstream, there is no free flow of the river. Thus the impact of the new Xiaoxi hydropower station on the river basin is limited.</p>		
1.1.3 Was an environmental management plan agreed with stakeholders incorporating environmental flows and other mitigation and enhancement measures and were monitoring and evaluation programmes defined?	15, 16	1,4, 5,6, 8	<p>The environmental aspects have been considered in the feasibility study report (FSR), the EIA and the water & soil conservation document.</p> <p>According to the contract of Xiaoxi hydro power infrastructure construction the detailed environmental protection actions (monitoring and evaluation programmes) during construction period have been defined.</p> <p>According to the approval of EIA the environmental flows is defined as 50 m3/s which can ensure ecological and agricultural water-usage demands downstream. The project design documents prove that the environmental flows have been considered and after operation of the project the flows can</p>		


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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
			<p>be ensured by the design and operation procedure.</p> <p>The local official from EPB said: During construction period, the local environment protection bureau implemented periodical inspections for the water quality, air quality and noise etc. But they didn't publish any formal report as there were no negative findings.</p> <p>When the project starts commissioning, the EPB will check and accept the project. At that time they will publish a formal acceptable report. After operation of the project, the EPB will check the environment quality status periodically per year.</p> <p>Verification Proposal 1:</p> <p><i>We propose to check the formal acceptance report published by EPB after the first year of operation of the power plant.</i></p>	VP1	VP1
1.1.4 Were acceptable rules developed for reservoir filling, commissioning, operation, emergency drawdown and decommissioning?	10, 11, 15	1	<p>Before reservoir filling the project operators has to completely clean the area of the reservoir which will be flooded according to the requirements of the area of the reservoir cleaning regulation for the hydro power engineering. The requirement is stipulated in the approval of the EIA.</p> <p>The regulations for commissioning, operation, emergency drawdown and decommissioning have been stipulated in the following state regulation:</p> <p>Precaution and Prevention of floods legal, safety management regulation of reservoir and dams, the authorization regulation for safety of reservoir and dams.</p> <p>According to the requirements of the above mentioned regulations, the authorized department for precaution and prevention of floods is in charge of the management of precaution and prevention of floods. The hydro power</p>		


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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
			<p>department is in charge of management of dam safety.</p> <p>The legal requirements of the state regulations have been considered by the project owner when defining the precaution and prevention of floods program in 2007 during the construction period, the monitoring and measurement system for the safety of the dam for the construction period and the preservation program of soil and water. These documents have been reviewed on site by the auditor.</p> <p>Verification Proposal 2:</p> <p>As the project is still under construction, the project owner didn't define the relevant commissioning, operation management regulations of the proposed project according to the state regulations, we propose to check if the regulations have been defined or implemented after the first year of operation of the power plant.</p>	VP2	VP2
1.2 Strategic Dimension 5: Recognising Entitlements and Sharing Benefits <local>					
1.2.1 Are compensation agreements in place? Have directly affected stakeholders not been socially or culturally disadvantaged when considering the net result of compensation and enhancement programs?	4,5, 19, 20	1,2, 3,4, 5,6, 7,8, 11, 12	<p>Village leaders and interviewed villagers agreed that the hydropower plant will bring many advantages and that therefore everybody supports its construction. This has been already proven by questionnaires survey for the local stakeholders affected by the project from Aug. to Oct. 2006.</p> <p>Through the construction of the project it can</p> <ul style="list-style-type: none"> • Improve the shipping condition of the river, the maximum ship capacity increased from 10t to 50t. • Improve the local traffic condition by re-built roads and newly built roads of 7.5 km length from Yiwutang village to Xiaoxi village. • Increase the employment for the local people. 		


CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
			<ul style="list-style-type: none"> • Build a water supply system for more than 1000 local people. • Build 4 small towns for the resettled people including water supply, electricity supply and roads. <p>According to the approval of the planning and design report for the resettlement and the occupied land of the proposed project, there are totally 7593 people affected, most of them are farmers, some of them are citizens. The total residential area affected amounts 315,144.3 m², farm land area 1.005 square km and the total compensation is 263,613,700 RMB.</p> <p>The whole resettlement process is described as follows:</p> <p>The survey for the affected people and villages during the FSR writing in summer 2004 confirmed how many people will be affected and how much land area will be occupied and flooded. This survey was implemented by Hunan province survey and design institute for water power. After finishing the survey the institute defined the planning design report of occupied lands and resettlement of the project in 2005. On Jan. 15 2006 the Hunan province people’s government approved the planning design report.</p> <p>Before construction of the project the project owner, the local resettlement bureau, the local people affected, the local land bureau and Hunan Xiangyi resettlement supervising company have implemented a survey to precisely investigate each individual case in depth. This includes investigation of the concrete houses area and occupied land area of each resettled individual or family. After the survey the migrating people will sign a resettlement compensation agreement with the project owner and the local resettlement bureau. When the migrating people don’t agree with the survey results, they can argue the issue with the resettlement bureau. Furthermore they can reflect their issues to the local government. The local government and the resettlement bureau will help them to resolve the issues.</p> <p>According to the agreement the affected people will get the relevant</p>		

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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
			<p>compensation from the project owner during the stages of construction. The process will be supervised by the mitigation bureau and the Hunan Xiangyi resettlement supervising company, which is a private company, and is thus a 3rd party.</p> <p>During the onsite visit the project owner provided the resettlement compensation agreements and the supervising monthly report of resettlement compensation work in April to the assessment team.</p> <p>Compensation aspects for above mentioned affected areas were carefully investigated by the assessment team. The entire area is village property; no private persons have usage rights in the area affected. Compensation for the flooded and permanently used area will therefore go directly to the village at first and then to individual people. The compensation agreements for the occupied lands have been signed between the village commissions and most of the affected people.</p> <p>Some villagers were randomly interviewed on the road or in their homes, without presence of any official authority. The villagers confirmed that they have been informed on the applicable laws and on the process. Some of them who have been affected or were presently affected due to the construction of the project have received compensation from the village commissions according to the signed compensation agreements. Others will get their compensation when they will be affected due to the construction of the project. The affected people are basically satisfied with the compensation results. Because some compensation will be based on the actually flooded / built area (to be finally determined at the time of commissioning the plant), some people did not yet know the total compensation amount. But they knew the compensation standard from other compensated people. The plan of the village commission is to utilize some compensation from the village property to invest it into communal infrastructure.</p>		

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			Verification Proposal 3: <i>As the compensation work is not yet finished, the net results of compensation therefore could not yet be verified against Chinese laws and the potential disadvantages for villagers. We propose to check compensation aspects again after the first year of operation of the power plant.</i>	VP 3	VP 3
1.2.2 Are benefit sharing agreements planned or in place before the production start of the power plant?	1	1,7	<p>The important benefits for villagers are to improve the local traffic condition through re-built roads and a newly built road of 7.5km length, from Yiwutang village to Xiaoxi village. Other benefits include the increased temporary employment for the local people during construction, the construction of a new water supply system for the local people of which more than 1000 local people will benefit and the construction of 4 small towns for the resettled people, including water supply, electricity supply and road connection.</p> <p>Other benefit sharing agreements are not planned; additional agreements or measures deem however not needed according to the understanding of the assessment team.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1.2.3 Has relevant documentation such as social and environmental impact assessment been made publicly available to relevant stakeholders?	17, 18	1	<p>Yes, the relevant documentation such as the EIA and EIA approval were made available for the local people affected.</p> <p>The concerned villages and even more the concerned farmers were not involved in the decision process and only informed when decision had been taken already. The relevant documentation was made available to them, but was not easily to access due to the bad traffic conditions, bad communication conditions and low level of education of the local people. This is a deviation from several guidelines of the WCD report.</p> <p>But as all affected people considered the entire project very positive neglecting this aspect did not lead to any negative consequences. We conclude that in this case despite of the violation of some WCD guidelines the more important effect (“no social or cultural disadvantages”) has been</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>


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			achieved and that therefore the essence of the WCD guidelines is still fulfilled.		
1.3 Strategic Dimension 7: Sharing Rivers for Peace, Development and Security <across province / country borders>					
1.3.1 Do mechanisms exist for sharing monitoring information with riparian provinces or States?	26	1	The project is located in the middle stream of Zishui river. Zishui river is running though Hunan province only. The project is the 4 th level of Zishui river according to the river-basin plan of Zishui river issued by the state water power department in 1998. So this question is not applicable for this project.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1.3.2 Are riparian states notified of any effects affecting them?	26	1	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
1.3.3 Were objections from riparian states addressed and resolved?	26	1	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2 PART II: ASSURE THAT COMMITMENTS ARE KEPT					
2.1 Strategic Dimension 3: Addressing existing Dams					
2.1.1 Are routines developed for reporting risks which can lead	12, 13	1	The safety level on Chinese construction sites does not necessarily correspond to international or even European standards. As the plant is not	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
to serious accidents and incidents?			<p>yet in operation details could not yet be checked. But a monitoring system about dam safety has been established by the project owner. The documents: the 23rd monitoring report, the precaution and prevention plan for flood in 2007 (defined according to the national standard), the preservation program for soil and water have been provided to the assessment team.</p> <p>Nevertheless see Verification Proposal 1.</p>		
2.1.2 Are routines established for dam safety work and are warning systems for risk situations in place?	12, 13	1,4, 5,	<p>As mentioned above, the project operator established a monitoring system about dam safety. Through the system they want to ensure dam safety in the construction and operation period. According to the monitoring system the operator defined the warning system for risk situations, in compliance with the precaution and prevention plan for flood in 2007.</p> <p>The approval of the earth-quake safety assessment report of the project has been given in March 2007 by Hunan province earth quake bureau.</p> <p>The final acceptance of the built dam before commissioning will be executed by the quality evaluation centre of the water resources office of the province of Hunan. This acceptance checks have not yet been carried out. During the operation phase, the dam will be checked periodically by the qualified authorized dam safety management committee from hydro power department in Hunan province.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.1.3 Are agreements reached with stakeholders and operators to modify operating rules of existing dams where needed?	21	1	<p>As the dams are still in their construction phase no operating rules exist up to now. At present no need can be seen for such agreements.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.2 Strategic Dimension 6: Ensuring Compliance					
2.2.1 Are sums for mitigation included in the financial concept	21	1, 13	<p>Compensation payments are mentioned in the approved feasibility study report and the approved preliminary design report. According to the approval</p>	See VP2	<input checked="" type="checkbox"/>


CHECKLIST TOPIC / QUESTION	WCD Guide -line	IRL	COMMENTS	Prel. Assess-ment	Final Assess-ment
of the project and has their financing been confirmed?			<p>of the planning and design report for the resettlement and the occupied land due to the proposed project, there are total 7593 affected people, houses area 315144.3m², farm land area 1.005 square km and the total compensation investment is 263,613,700yuan.</p> <p>According to the provided supervising monthly report in April the compensation payments have been paid 196,750,000 up to April. The whole resettlement and compensation work is expected be finalized before the end of Oct. 2007.</p> <p>As the compensation work is not finished now, we propose to check the aspect after 1 year of operation of the project. See VP 2.</p>		
2.2.2 What means have been chosen to guarantee multi-year compensation / benefit payments (i.e. performance bonds, trust funds)?	23, 24, 25	1	<p>According to the support policy during operation stage of hydro power station for the resettled people due to reservoir flooding, dated July 1 2006, the resettlement people can receive 600yuan per person per year for a period of 20 years. The provincial government will establish a support fund. The capital of the fund will be collected from sale of electricity of different power plants. The provincial government will control and distribute the money to the resettlement people.</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2.2.3 Did the developer demonstrate that proposed mitigation and development measures have been implemented and meet their objectives?	21	1	<p>As the project is in its early phase of construction and will become operational only in the second half of 2007 this aspect could not be checked during the on-site visit.</p> <p>Verification Proposal 4:</p> <p><i>We propose to check realisation of benefit sharing mechanisms and mitigation and development measures after the first year of operation of the power plant.</i></p>	VP 4	VP 4
2.2.4 Is institutional capacity available to monitor and	21, 22	5,6, 8	<p>The requirements postulated in the EIA, the water & soil conservation program and the river basin program will be checked by the respective local</p>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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enforce commitments for social and environmental components of the project?			authorities. For the migration plan please refer to 1.2.1.		
2.2.5 Was the implementation of social, environmental, health and cultural heritage mitigation measures reviewed by an independent panel?	22	1,2	<p>As Mentioned in the chapter 1.1.3 the EIA has been approved by the EPB and written by the qualified organization Hunan province water power survey and design institute.</p> <p>As mentioned in the chapter 1.2.1, the whole compensation and resettlement work will be supervised by the Hunan Xiangyi resettlement supervising company, which is a private company, belongs to the 3rd party.</p> <p>Also EIA has been approved and written by independent panels.</p>	☑	☑
2.2.6 Are benefit-sharing mechanisms modified as necessary with the agreement of affected groups?	20	1,2	<p>As the project is in its early phase of construction and will become operational only in the second half of 2007 this aspect cannot be checked now.</p> <p>Verification Proposal 3: <i>See section 2.2.3</i></p>	See VP 3	☑
2.2.7 Will a full feasibility study be undertaken for any proposal for any major physical change? Will the influence of climate change be considered on benefits and dam safety?	5,6, 10, 11, 21	1,4	<p><u>Clarification Request 2:</u></p> <p>Dependent on the scope of future changes of the power plant feasibility studies may be required by law. But no explicit commitment by the project owner exists covering this aspect.</p>	CR 2	☑

3 PART III: ASSURE THAT THE PROJECT MAKES SENSE


If Part I / II shows no or a low level of disadvantages / commitment issues, the short version of questionnaire III will be applied, otherwise the extended version will be used.

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Explain, why part I / II leads to the conclusion that the short or the extended version of the Part III comments is used			The Xiaoxi project brings considerable advantages to the affected villages and villagers, and no real disadvantages. The living conditions are improved. Therefore the short version of comments is used in the following.		
Part III / Short comments version					
3.1 Strategic Dimension 1: Gaining Public Acceptance					
3.1.1 Were affected stakeholders clearly defined based on a river-basin wide understanding of relevant social, economic, and environmental values, requirements, functions, and impacts?	1	1,2,5,6,8	<p>According to the approval of the planning and design report for the resettlement and the occupied land due to the proposed project, approved by the Hunan province people’s government on Jan. 15 2006, there are 41 villages involved in total. Twenty of these villages involve resettled people; the other villages are only affected by flooded lands.</p> <p>In the planning and its approval the affected stakeholders were clearly defined based on a river-basin wide survey of relevant social, economic, and environmental values, requirements, functions, and impacts.</p>	☑	☑
3.1.2 Are stakeholders identified for consideration of operational issues and any proposed changes that impact on them or the environment?	1	1	<p>Stakeholders have been identified. Apart from the project owner and the local / regional government the obvious stakeholders for operational issues are the villages affected by the project.</p> <p>The project owner and the local government took part in the decision process of the project. Other stakeholders (local people) knew about the project in the early stage of FSR and were informed about the project in more detail in the survey stage regarding occupied lands and resettlement of the FSR in 2004.</p>	☑	☑
3.1.3 Did stakeholders participate in the project design and the negotiation of outcomes that affect them?	1,2,3	1	<p>The concerned villagers and their leaders were not involved in the decision process. According to our information the project owner negotiated the project with the provincial and regional government. As mentioned already under 1.2.2 this is a deviation from several guidelines of the WCD report.</p> <p>On the other side, as outlined in section 1 and 2 of this protocol, all affected</p>	☑	☑

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			people considered the entire project very positive and they all have improved their living environment. As the core requirement of “no social or cultural disadvantages” has been achieved the essence of the WCD guidelines is still fulfilled.		
3.1.4 Was an appropriate process established to address any disparities between the needs expressed through the public consultations and the stated development objectives?	1,2,3	1	As mentioned in the chapter 1.2.1, when the migrating people don't agree the survey results, they can argue the issue with the resettlement bureau. Furthermore they can reflect their issues to the local government. The local government and the resettlement bureau will help them to resolve the issues. Concerning the fulfilment of WCD guidelines, the same remarks are valid as under 3.1.3	☑	☑
3.1.5 Which other measures have been taken to increase public acceptance?	1,2,3	1	As mentioned in section 1.2.1 through the project implementation the project <ul style="list-style-type: none"> • Improves the local traffic condition through re-built road and built new road with 7.5km from Yiwutang village to Xiaoxi village. • Increases the employment positions for the local people. • Builds a water supply system for the local people so that more than 1000 local people got the benefits. • Builds 4 small towns for the resettlement people including water supply, electricity supply and road. 	☑	☑
3.2 Strategic Dimension 2: Comprehensive Options Assessment					
3.2.1 Has a comprehensive structural needs and options assessment been implemented at the national and / or regional level before	4, 5, 10, 11	1,2, 16, 17	The Chinese electricity production is mainly coal-based and the Central China Power Grid (CCPG) has therefore high CO ₂ emissions of 1,2526 tCO ₂ e / MWh. The growth of Chinese economy leads to even more coal-fired power plants. On national level renewable energies are therefore seen as a very important resource to limit emissions. Hydro power is the most important segment of renewable energies in China, and the national Chinese energy	☑	☑

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the start of the project?			strategy promotes hydro power production. Even if the production of the Xiaoxi power plant covers only 1.3% of the consumption of the province of Hunan, the combined output of medium sized hydro power plants can be considered as one important part to a cleaner electricity production in Central China.		
3.2.2 Are investigations analysed on a river basin-wide understanding of social, economic, and environmental values, requirements, functions, and impacts including cumulative impacts, and was the pre-cautionary approach applied?	5,10, 11	2,4, 5,6	As explained earlier, the documents “feasibility study report”, “EIA” and “water & soil conservation documentation” have covered those local aspects in detail and analysed all important aspects. No negative consequences were found. However, it can not be excluded that the final versions of those documents lead to different judgments (see CR 1).	☑	☑

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Reference No.	Document or Type of Information
	2007.(the designed installation capacity is increased from 120MW to 135MW)
8.	EIA, dated in March.2005, Hunan province survey design and research institute for water source and hydro power, submitted on March 15 2007.
9.	Approval of EIA, dated April 29 2005, Hunan province survey design and research institute for water source and hydro power, submitted on March 15 2007.(the approved installation capacity is 120MW)
10.	Organization chart of Hunan Xinshao Xiaoxi Hydropower Development Co. Ltd, submitted on March 15 2007.
11.	The approval of the planning design report of resettlement and occupied lands for the proposal hydro power project, dated on Jan.15 2006, Hunan province government, submitted on March 15 2007.
12.	The approval of the preservation program about water and soil, dated on July 12 2004, Hunan province water power department, No. (2004)44, submitted on March 15 2007.
13.	The purchase contract of the devices of generator units and main transformer, submitted on March 15 2007.
14.	The license of Hunan Xinshao Xiaoxi Hydropower Development Co. Ltd, submitted on March 15 2007.
15.	Evidences of capital source, submitted on March 15 2007.
16.	Approval of pre-utilization land, issued by Hunan province government, dated on Jan.5 2065, Submitted on March 15 2007.
17.	Approval of connected to the Hunan grid, issued by Hunan province power company, No.(2006)936, dated on August 29, 2006, Submitted on March 15 2007.
18.	Construction schedule in 2007, Submitted on March 15 2007.
19.	Contract of Infrastructure construction of the project, No. XXTJ-06, about construction safety and environmental protection actions
20.	Approval of earthquake safety assessment report of the project, dated on March 22 2007, Hunan province earthquake bureau
21.	Precaution and prevention program of flood of Xiaoxi project in 2007
22.	Reservoir dams safety authentication regulation, issued by the state hydro power department on June 24 2003
23.	Supervising monthly report in April, by Hunan province Xiangyi resettlement supervising company
24.	Introduction of dam safety monitoring system of the project
25.	Monitoring report in the 23 rd times, Hunan province long-distance monitoring devices Co. Ltd.
26.	Levels hydro power stations collocation map in Zishui river basin

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Reference No.	Document or Type of Information
27.	Sample of questionnaires, dated on Oct. 18 2006
28.	Sample of houses compensation for the local affected people
29.	New EIA, dated on Sept. 28 2007, Hunan province water power survey and design institute, submitted on Nov.
30.	The approval of new EIA, dated on Oct. 12 2007, Hunan province EPB
31.	The project operation promises letters, dated on Oct. 25 2007, submitted on Nov.