Journal of Construction in Developing Countries, Vol. 12, No. 2, 2007

Direct Stakeholder's Perception of PPA Clauses in the Nepalese Environment

R.B. Shrestha and *Stephen Ogunlana

Abstract: The paper analyses the perceptions of the stakeholders regarding the key issues in Power Purchase Agreements (PPAs) in the Nepalese Environment. A total of 90 questionnaires representing sponsors, utility, lenders and government officials were used for the study. The questionnaire sought the perception of the stakeholders regarding the significance (importance) of the clauses and the likelihood of inclusion of the clauses in PPAs. Comparison of the ranks of means was conducted by Kruskal-Wallis tests to see the significance of the differences in responses of the stakeholders and Mann-Whitney tests to see the significance of the differences of the pairs of stakeholders. Data analysis showed clauses where the prime stakeholders have similar stands and clauses where the perceptions are divergent. The findings of this paper will help the stakeholders in negotiating PPAs.

Keywords: Independent Power Producers (IPPs), Power Purchase Agreements (PPAs), Take or pay contracts, Guarantees

INTRODUCTION

Over the past decade in Nepal, Independent Power Producers (IPPs), with local and foreign investment, have contributed more than 25% of the total generation capacity playing a major role in installing new hydropower facilities in the country. This has been facilitated by the introduction of Electricity Act 1992 and the Hydropower Policy in 1992, by which a comprehensive legal framework for the development of hydropower was put in place for private participation in hydropower projects in Nepal. In contract-led projects like IPPs, offtake contracts are entered between the user organizations or individuals purchasing the offtake or using the facility itself and the promoter, Project Sponsors (Merna and Smith, 1994). In IPP projects, the offtake contract, termed Power Purchase Agreements (PPAs), can be defined as a contract for a large customer to buy electricity in bulk from a power plant.

Construction, Engineering and Infrastructure Management, Asian Institute of Technology, Bangkok, THAILAND.
*Corresponding author: ogunlana@ait.ac.th

Crow (2001) has considered PPAs as the most important contract underlying the construction and operation of a power plant usually drawn at the implementation phase of IPP projects, as there can be no project if PPA is not reached. It is also extremely complex and politically sensitive issue, since it is the PPA that ultimately governs the price of electricity delivered to end-users. The other project agreements including those covering engineering, procurement, construction, lending, operations and maintenance, can be negotiated only after the PPA is concluded.

As pointed out by Shrestha and Ogunlana (2006), in developing countries, the purchaser is, in almost all of the cases, the state owned enterprise often with monopoly on generation, transmission, and distribution of electric power while the project developers may be foreign investor, local investor, or a joint venture between local and foreign investors. The PPAs reached between the state-owned enterprise and the project sponsor is the contractual arrangement for sharing the risks and responsibilities between the contracting parties for a term, which may span up to 25–30 years depending on the contract.

Shrestha and Ogunlana (2006) also points out that Nepal, a developing country that lies between India and China, has an estimated hydropower generating potential of about 43,000 MW. However Nepal's current total installed generating capacity is only about 600 MW and its per capita electricity consumption of about 42 KWh is amongst the lowest in the world. Only about 40% of the population has access to electricity. In rural areas where the bulk of the population resides, access is even lower (5%), partly as a result of a higher priority given to providing power to high-density urban areas. Total energy requirement in Nepal is projected to grow by an average of 8% per annum over the forecast period of 2004 to 2020. Prior to 1992 hydropower development policy, private sector generation consisted of only a small amount of energy supplied by Butwal Power Company (BPC), the first IPP with limited capacity. The company was established in 1978 with His Majesty's Government of Nepal (HMG/N) and United Mission to Nepal (UMN) shareholding primarily for Andhi Khola Hydroelectric and Rural Electrification Project (AHREP). Since then, considerable progress has been made in IPP with Khimti, Upper Bhotekoshi, Indrawati and a number of other IPPs coming into operation with a combined capacity of 140.6 MW, which is 26.25% of the total system. There are eleven projects in operation under IPP programme and three others at various stages of construction. PPAs have been concluded for fourteen more projects between private sponsors and the utility: Nepal Electricity Authority (NEA), the only vertically integrated government subsidiary, charged with the responsibility of generation, transmission, and distribution of electric power in the country. NEA operates as a single

purchaser and single largest supplier and distributor of electricity in the country (NEA, 2005). The old hydropower policy of 1992 was replaced by Hydropower Development Policy 2001 to provide further impetus to the active participation of the private sector (Shrestha and Ogunlana, 2006).

As pointed out by Head Chris (2000), all private infrastructure development carries common risks such as political, currency exposure, force majeure, etc. but hydropower is perceived as being exposed to additional risks in project definition, risks in hydrology, environment, financing, and regulatory risks. In Nepal, investment in hydropower has not been forthcoming. Disputes in PPAs have deterred private investments in electricity sector in Nepal. Even straightforward issues like scheduled outages and contract energy have led to disputes in PPAs in the Nepalese environment. Therefore, in the process of designing PPAs, a variety of questions need to be asked about the best feasible means satisfying the concerned parties allowing them to come to a zone of possible agreement.

When negotiating PPAs, the two prime stakeholders must first determine what they must have and what they are willing to give (bargaining chips), gather facts about the other party, learn about the other party's negotiating style and anticipate other side's position and prioritize issues. To ensure smooth negotiation, one should also prepare alternatives proposals and establish the Best Alternative To a Negotiated Agreement (BATNA). Estimate the other party's needs, bargaining chips and BATNA. The objective of this paper is to help identify the positions of the relevant stakeholders so that they can strive to reach agreement or courses of action to take where there is some degree of difference in interest, goals, values or beliefs.

PRINCIPAL ISSUES IN PPAs

Various authors have extensively studied major risk issues involved in infrastructure and hydropower development. Woody and Pourian (1992) have identified risks associated with project financing categorized into five groups. They are the start-up-cost risk, operating risk, technology risk, market risk, and political risk.

Ernst and Pham (1995) identified a number of risks with regard to BOT project financing:

- Construction risks
- Performance/technology risks
- Force majeure risks
- Economic risks

Gupta and Sravat (1998) have identified the following issues in development and project financing of private power projects in developing countries:

- Country political risk
- Development and construction
- Operation and maintenance risk
- Foreign exchange risk
- Non-payment by sole power purchasers
- Regulatory risks

After considering risks studied in BOT projects and the issues and clauses that figure in most existing PPAs and the contentious issues faced by the stakeholders, the following were identified as being particularly suitable for the objective of this study in the Nepalese environment:

1. Power Purchase Guarantees (PPGs)
2. Force Majeure Guarantees (FMGs)
3. Financial and Foreign Exchange Guarantees (FFGs)
4. Operation risks
5. Dispute resolution and insurance issues

The perceptions of the stakeholders in these issues will be the basis of identifying the shared interests and the positions of the negotiating partners and other stakeholders.

RESEARCH METHODOLOGY

The questionnaire was developed based on the five main identified issues in PPAs mentioned above. The clauses that were tested for each category are as follows:

1. PPGs
   - Take or pay clause
   - Energy before RCOD
   - Min. energy supply
   - Excess energy
   - Demand charge (capacity)
   - Third party sales
2. FMGs
   - Political risks
   - Natural disasters
   - Changes in laws
   - Buyout clauses
3. FFGs
   - Convertibility
   - Repatriation
   - Escalation
   - Tax holidays
   - Conc. Funding

4. Operation risks
    - Dispatch rights clauses
    - Scheduled outages
    - Availability declaration
    - Maintenance clauses

5. Other risk mitigating measures
    - Informal dispute boards
    - Arbitration
    - Insurance before RCOD
    - Insurance after RCOD

Each clause of the specified category was considered independently from the other types. The questions were asked with a two-pronged approach: asking the respondents to rate each factor according to its significance (importance) and the likelihood of inclusion of each factor in PPAs of their involvement. The perceptions of the stakeholders deduced from the responses regarding the clauses are as follows:

- Clauses rated very significant and very likely to be included in PPAs are inferred as important clauses with positive impact for the stakeholder.
- Clauses rated significant and highly unlikely to be included in PPAs are inferred as clauses with negative impact for them.
- Clauses rated insignificant but likely to be included are inferred as less important clause with positive impacts.
- Clauses rated insignificant and unlikely to be included in PPAs are inferred as clauses less important with negative impacts for the stakeholders.
- Intermediate ratings are inferred as per se.

A five-point Likert scale was used with point (3) as a neutral point to separate low level of significance, insignificant (2) and highly insignificant (1) ratings from high level of significance significant (4) and very significant (5) ratings. Similarly, point (3) was used as a neutral point to separate low level of likelihood unlikely (2), and highly unlikely (1) (less than 3 points) from high level of likelihood, likely (4) and extremely likely (5) ratings in likelihood of inclusion of the factors in PPAs of involvement of the respondents.

The questionnaire also contained the respondent's organization, the profession, and years of involvement in the IPP industry. This allowed classifying the respondents according to the stake in the industry.

The target population being studied for this research was a combination of professionals involved in IPP projects such as sponsors, bankers, and utility and government officials to represent the stakeholders, knowledgeable in

the issues of PPAs. The sampling technique used for data collection was judgement sampling, conforming to criterion like the experience of the respondents in the field of IPP projects rather than a randomly chosen sample. To improve the representativeness, proportionate sampling quota for all the four stakeholders was assigned. The respondents from the IPPs were chosen to represent all the relevant class of industry.

The statistical population for the sampling frame was drawn from the following sources:

1. Project sponsors
   - IPPAN – IPPs Association of Nepal Directory
   - NHA – Nepal Hydropower Association Directory
2. Utility
   - NEA – Nepal Electricity Authority Directory
3. Lenders
   - Banker's Consortium Directory
4. Government
   - Ministry of Water Resources
   - Water and Energy Commission

The abovementioned organizations maintain a comprehensive directory of all the organizations and individuals related to IPPs. The respondents for the study were all individuals involved in IPP. Priority was given to decision makers among the stakeholders.

DATA ANALYSIS

Details of the Respondents

Ninety respondents from four prime and secondary stakeholders returned completed questionnaires. The respondents were decision makers in their respective fields and represented lenders, sponsors, utility and the government. There were 22 respondents representing lenders from four leading commercial bank involved in financing IPPs. Likewise, there were 28 respondents representing sponsors from seven IPPs. The 22 respondents from the utility are all involved in power trade and decision makers in their respective fields. The 18 respondents representing the government are from the Department of Water Resources, Department of Electricity Development and the Water and Energy Commission Secretariat.

Table 1. Percentages of different types of respondents

Respondents	No.	Percentage
Lenders	22	24.44
Project sponsors	28	31.11
Utility officials	22	24.44
Government officials	18	20.00
Total	**90**	**100.00**

The data analysis consisted of the following:

1. Comparing the means of the responses for each set of guarantees regarding the significance and the likelihood of inclusion of the clauses in PPAs as presented in Tables 2–6.

2. Kruskal-Wallis test – A non-parametric test with no assumptions about the shape of the underlying population distribution is carried out for each set of responses. The null hypothesis for this test is that the samples come from the same population or from the population with identical means and the alternative hypothesis is that not all the population comes from the same population. The critical values for rejecting the hypothesis are from the chi-squared table determined by comparing the calculated probability with the alpha level which has been set at 0.05. If the "Prob." value is less than or equal to 0.05, the result is significant. The results are presented along with the means of the respondents.

3. Mann-Whitney test – These tests are carried out to see how the means of the chosen pairs of samples differ and to see the degree of separation. The null hypothesis assumes that the two sets of scores are samples from the same population and do not differ significantly. The alternative hypothesis, on the other hand, states that the two sets of scores differ significantly. The maximum separation is indicated by a U=0 and small values of U lead to rejection of H_o and large values of U lead to failure to reject the null hypothesis. The critical values for rejecting the hypothesis are determined by comparing the calculated probability with the alpha level which has been set at 0.05. If the "Prob." value is less than or equal to 0.05, the result is significant. The test are carried out for the following pairs of samples:

    - Prime stakeholders: sponsors and utility
    - Project sponsors and lenders
    - Utility and government

The abovementioned stakeholders are pairs who deal with each other and consensus in their perceptions help in reaching the PPAs sooner.

Means of the responses of the stakeholders shown in Table 2 show the importance of the category of PPGs: take or pay contract, supply guarantees of minimum energy and the purchase guarantees of excess energy, where all the stakeholders have rated it as being very important in PPAs. As shown by Kruskal-Wallis test in Table 2, the null hypothesis that there is no significant difference between the responses of the stakeholders regarding the importance of clauses: take or pay, energy before RCOD, demand charge and supply guarantees of minimum energy is being accepted at 5% level of significance. However, there is a significant difference in the responses at the same level of significance regarding the clauses: excess energy and third party sales with Kruskal-Wallis test indicating that some stakeholders regard these clauses as more significant than others. Mann-Whitney tests carried out for the pairs of prime stakeholders, who actually deal with each other: utility vs. sponsors, lenders vs. sponsors, and utility vs. government, show that the null hypothesis is rejected at 5% level of significance in the importance of the clause: supply of the minimum energy, but for the other clauses of the category, PPGs, the null hypothesis is accepted at the same level of significance. The null hypotheses are accepted for all the clauses regarding importance of PPGs at the same level of significance for the pair: lenders and sponsors. For the pair: utility and government, the null hypothesis on the importance of PPGs is rejected for the clause: excess energy.

Regarding the likelihood of inclusion of PPGs, Kruskal-Wallis tests showed that the null hypothesis that there is no significant difference between the responses of the stakeholders is rejected at 5% level of significance for clauses: take or pay, supply of energy before RCOD, supply guarantees of minimum energy, supply of excess energy and accepted for clauses: demand charge and supply to third party sales. The clauses, take or pay, energy before RCOD, excess energy are favoured more by the lenders and sponsors while the supply guarantees of minimum energy is favoured by the utility and the government. Meanwhile, Mann-Whitney tests showed that the null hypothesis, that there is no significant difference in the responses of the pair of prime stakeholders: utility vs. sponsors, is being rejected at 5% level of significance for the clauses: take or pay, supply of energy before RCOD, supply guarantees of minimum energy, supply of excess energy and accepted for clauses: demand charge and third party sales. As mentioned above, the clauses: take or pay clause, supply of energy before RCOD, and supply of excess energy are being favoured by sponsors and the supply guarantees of minimum energy by the utility. There is no significant difference between the responses of the

Table 2. Issues Concerning PPGs

Significance of PPGs

	Means				Kruskal-Wallis	
	Lends.	**Spons.**	**Util.**	**Govt.**	**KW**	**Sig. P**
Take or pay clause	4.41	4.36	4.68	4.50	2.24	0.52
Energy before RCOD	3.77	4.04	3.73	3.44	7.02	0.07
Min. energy supply	4.36	4.25	4.68	4.50	5.66	0.13
Excess energy	4.09	4.11	4.23	3.39	**12.73**	**0.01**
Third party sales	3.77	4.04	3.86	3.11	**11.80**	**0.01**

Likelihood of Inclusion in PPAs

	Means				Kruskal-Wallis	
	Lends.	**Spons.**	**Util.**	**Govt.**	**KW**	**Sig. P**
Take or pay clause	4.50	4.46	2.86	2.94	***41.65**	**0.00**
Energy before RCOD*	3.86	4.25	2.82	3.33	**31.63**	**0.00**
Min. energy supply	4.23	4.18	4.77	4.56	**13.12**	**0.00**
Excess energy	3.82	4.14	2.18	2.78	**46.31**	**0.00**
Demand charge (capacity)	3.68	3.25	3.00	3.22	5.85	0.119
Third party sales	3.95	3.82	3.36	3.89	4.95	0.18

Significance of PPGs–Mann-Whitney

	Spons. vs. Util.		Lend. Vs. Spons		Util. vs. Govt.	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Take or pay clause	252.50	0.21	302.50	0.91	177.00	0.58
Energy before RCOD*	281.00	0.57	246.00	0.18	147.00	0.17
Min. energy supply	**205.00**	**0.02**	282.00	0.58	169.50	0.44
Excess energy	261.50	0.33	302.00	0.90	**90.50**	**0.00**
Demand charge (capacity)	264.00	0.363	255.00	0.263	150.50	0.199
Third party sales	296.50	0.81	261.00	0.31	**119.00**	**0.03**

Likelihood of Inclusion in PPAs–Mann-Whitney

	Spons. vs. Util.		Lend. vs. Spons.		Util. vs. Govt.	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Take or pay clause	**86.50**	**0.00**	306.00	0.96	185.00	0.71
Energy before RCOD	**92.50**	**0.00**	212.53	0.04	**129.00**	**0.04**
Min. energy supply	**170.00**	**0.00**	307.00	0.98	155.00	0.15
Excess energy	**38.00**	**0.00**	241.00	0.17	**116.00**	**0.02**
Demand charge (capacity)	262.50	0.35	236.50	0.129	172.00	0.45
Third party sales	232.00	0.12	273.00	0.46	141.00	0.10

Notes: Bold figures denote responses significantly different at 5% level of significance
* Energy before Required Commercial Operation Date (Interim Energy)

pair: lenders and sponsors, regarding the likelihood of inclusion of the PGs. Lenders and sponsors both favour the clauses: take or pay clause, purchase of energy produced before RCOD, and purchase of excess energy and moderately favour demand charge and third party sales. For the pair: utility and government, the null hypothesis is rejected for the clauses energy before RCOD and supply of excess energy with the utility less in favour of the purchase of excess energy than the government albeit marginally. The government and the utility both favour the clause supply guarantees of minimum energy and they are not in favour of inclusion of take or pay clause, purchase of energy before RCOD and purchase guarantees of excess energy.

In general, the parties have rated the clauses significant and unlikely to be included in the PPAs as follows:

- Utility: Take or pay, min. contract, excess energy
- Government: Take or pay, excess energy

Clauses rated significant and likely to be included in PPAs are:

- Sponsors: Take or pay, interim energy, min. energy, excess energy, third party sales
- Utility: Min. contract

From the responses, it can be inferred that for the utility, take or pay, supply of minimum energy, and purchase guarantees of excess energy are severe clauses. For the sponsors along with the lenders, it can be inferred that clauses take or pay contract, supply of interim energy, and supply of excess energy have been favourable and they prefer including it in PPAs. The alternative the utility has in addition to take or pay clause in future negotiations are: take if offered clause or take and pay clause where the utility will not have to pay for the energy that it is not able to dispatch.

As shown by Kruskal-Wallis tests in Table 3, there is no significant difference in the responses of the stakeholders regarding the significance of majority of force majeure clauses. There is a significant difference in the responses of the stakeholders regarding political risks. The sponsors and the utility have rated the political risks and natural disaster risks clause as being more significant than the lenders and the government. Changes in law have been rated as being more significant by all the stakeholders. Regarding the likelihood of inclusion in PPAs of force majeure clauses, there is a significant difference in the responses between the stakeholders as indicated by Kruskal-Wallis test in the clauses: political risks and natural disaster risk and there is no significant difference in the clauses: changes in law and buyout clauses. Political risk clauses are favoured more by

Table 3. Issues Concerning FMGs

Clause	Means				Kruskal-Wallis	
	Lends.	Spons.	Util.	Govt.	KW	Sig.
Significance of FMGs						
Political risks	3.95	4.39	4.23	2.89	**29.78**	**0.00**
Natural disasters	4.09	4.54	4.18	4.33	2.758	0.43
Changes in laws	3.91	3.82	4.05	4.17	1.943	0.584
Buyout clauses	3.68	3.75	4.14	3.83	4.17	0.25
Likelihood of inclusion in PPAs						
Political risks	3.91	4.50	3.86	3.17	**27.393**	**0.00**
Natural disasters	4.18	4.75	4.41	4.50	**9.524**	**0.02**
Changes in laws	3.91	3.79	3.55	3.78	1.329	0.722
Buyout clauses	3.55	3.29	4.09	3.72	10.097	0.018
Significance of FMGs – Mann-Whitney						
	Spons. vs. util.		Lends vs. spons		Util. vs. govt.	
	U-test	Sig. P	U-test	Sig. P	U-test	Sig. P
Political risks	268	0.39	218	0.059	**42.00**	**0.00**
Natural disasters	260.50	0.30	233.50	0.108	193.00	0.90
Changes in laws	274.50	0.488	306	0.967	182.50	0.677
Buyout clauses	233.50	0.121	294.50	0.777	154.50	0.24
Likelihood of inclusion of FMGs in PPA – Mann-Whitney						
	Spons. vs. util.		Lends vs. spons		Util. vs. govt.	
	U-test	Sig. P	U-test	Sig. P	U-test	Sig. P
Political risks	**169**	**0.003**	**189**	**0.012**	**99.50**	**0.006**
Naturald disasters	**222**	**0.042**	**175.50**	**0.003**	188.00	0.798
Changes in laws	266	0.391	300.50	0.877	174.00	0.527
Buyout clauses	**161**	**0.002**	258	0.295	150.50	0.199

Note * Bold figures denote responses significantly different at 5% level of significance

the sponsors and the lenders than the utility and the government. Natural disaster clauses are favoured by the sponsors and the government. Inclusion of changes in law clauses has been given moderate importance by the stakeholders. Mann-Whitney tests, carried out between the pairs of prime stakeholders show that between the prime stakeholders: the sponsors and the utility, and the lenders and the sponsors, there are no differences regarding the significance in all of the clauses, while between the pair: utility and sponsors, there is a difference regarding the significance of the political risks clause.

However, there is a difference in responses between pairs of the prime stakeholders in the likelihood of inclusion of the force majeure clauses. Mann-Whitney tests show that there is a significant difference between the pair of stakeholders; sponsors vs. utility regarding the likelihood of inclusion of FMGs; political risks, natural disaster risks and buyout clauses, and no significant difference in the responses regarding the inclusion of the clause: changes in law. The sponsors are in favour of including political risk and natural disaster clause while the utility is in favour of including the natural disaster clause and buyout clause. Both prime stakeholders agree on the inclusion of changes in law clauses. For the pair: lenders and sponsors, Mann-Whitney tests show that there is a significant difference in perception of inclusion of the political risks and risks regarding natural disaster and no significant difference in the clauses: changes in law and buyout clauses. The sponsors are more in favour of political risks and natural disaster risk than the lenders while the lenders are more in favour of changes in law and buyout clauses than the sponsors. Between the pair of stakeholders: government and utility, regarding the inclusion of force majeure risks, Mann-Whitney tests show that there is a significant difference in the political risks clause. The government is less in favour of including political risk clause in PPAs although its subsidiary, the utility, is in favour of the clause.

In short, the parties have rated the following clauses as significant and likely to be included in PPAs:

- Sponsors: Political risks, changes in laws, natural disaster risks
- Utility: Natural disasters, buyout clauses
- Lenders: Political risks, changes in laws, natural disaster risks
- Government: Natural disasters

Table 4. Issues Concerning FFGs

Significance of FFGs						
	Means				**Kruskal-Wallis**	
	Lends.	**Spons.**	**Util.**	**Govt.**	**KW**	**Sig.**
Convertibility	4.00	3.75	2.77	3.67	***20.94**	**0.00**
Repatriation	4.45	4.04	3.91	4.50	7.25	0.06
Escalation	4.59	4.36	4.32	4.44	1.31	0.73
Tax holidays	3.68	4.36	3.86	4.00	**8.32**	**0.04**
Conc. funding	4.41	4.14	3.36	4.44	**11.66**	**0.01**
Likelihood of Inclusion of PPAs						
Convertibility	4.32	3.46	3.14	3.44	**21.48**	**0.00**
Repatriation	4.41	3.21	3.50	3.61	**21.11**	**0.00**
Escalation	4.45	4.36	3.77	3.83	**11.51**	**0.009**
Tax holidays	3.59	4.36	3.59	3.00	**24.97**	**0.00**
Conc. funding	4.05	4.25	3.18	3.89	**15.93**	**0.001**
Significance of FFGs–Mann-Whitney						
	Spons. vs. util.		**Lends. vs. spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Convertibility	132	**0.00**	263.50	0.347	85	**0.002**
Repatriation	304	0.934	214	0.043	138	0.106
Escalation	286	0.633	255.50	0.247	194	0.925
Tax holidays	267	0.385	**177.50**	**0.007**	170	0.459
Conc. funding	200	0.027	268	0.395	99	**0.006**
Likelihood of Inclusion of FFGs in PPAs						
	Spons. vs. util.		**Lends. vs. spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Convertibility	238.50	0.15	159.50	**0.002**	147.50	0.17
Repatriation	264	0.37	**100**	**0.00**	184.50	0.72
Escalation	**205**	**0.03**	283	0.58	198	1.00
Tax holidays	**172.50**	**0.00**	**156.50**	**0.00**	117.50	0.03
Conc. funding	131	**0.00**	260.50	0.312	124	0.05

Note: Bold figures denote responses significantly different at 5% level of significance

There is disagreement in the perceptions of the stakeholders regarding the importance of three of the financial and foreign exchange category of risks. Kruskal-Wallis tests show the null hypothesis, that there is no significant difference in the perceptions of the stakeholders regarding importance of the clauses, is rejected at 5% significance level for clauses: convertibility, tax holidays, and concessional funding and accepted for escalation and repatriation clauses. Convertibility and concessional funding is rated significant by the lenders while tax holiday clause is rated significant by the sponsors. The repatriation and escalation clauses have been rated as significant by all the stakeholders. Mann-Whitney tests showed that for the prime stakeholders: utility and sponsors, the null hypothesis, that there is no significant difference between the responses of the two stakeholders is rejected at 5% significance level for convertibility clause while the perceptions on the significance of other clauses in financial and foreign exchange group of risks are accepted. Likewise, test shows that the null hypothesis that there is no significant difference between the perceptions of the pair: lenders and sponsors regarding the importance of financial and foreign exchange group of risks is rejected for clause: tax holidays, and for pair: utility and government is rejected at the same significance level for clauses: convertibility and concessional funding.

On the other hand, Kruskal-Wallis test shows the perceptions of likelihood of inclusion of the same group of clauses were all rejected at 5% level of significance. The responses of the stakeholders regarding the inclusion of FFGs differ significantly among the stakeholders. As shown in Table 4, Mann-Whitney tests show that the null hypothesis that there is no significant difference between the perceptions of the prime stakeholders: sponsors vs. the utility regarding the inclusion of the clauses in PPAs, is rejected at 5% significance level for the clauses: escalation and tax holidays. The clauses escalation, tax holidays and concessional funding are favoured by the sponsors while the utility has rated the clauses as being moderately likely to be included in PPAs. Likewise, for the pair: lenders and the sponsors, the null hypotheses that there is no significant difference in the responses of this pair of stakeholders were rejected for clauses: convertibility, repatriation and tax holidays. The lenders favour the inclusion of the clauses convertibility and repatriation while the sponsors are in favour of the inclusion of tax holiday clause. Mann-Whitney tests also show that for the pair of stakeholders: utility and government, the null hypotheses that there is no significant difference in the responses of the respondents regarding inclusion of financial and foreign exchange clauses were accepted for all the clauses.

The clauses rated significant and unlikely to be included in PPAs are as follows:

- Lenders: Devaluation
- Government: Devaluation

And clauses rated significant and likely to be included in PPAs are:

- Sponsors: Escalation, tax holidays, concessional funding
- Lenders: Escalation, repatriation, convertibility, concessional funding

The sponsors perceive the likelihood of inclusion of escalation, tax holidays, and concessional funding clauses and the lenders perceive escalation, repatriation, and convertibility as important issues and favour including it in PPAs. For the utility, escalation and devaluation are more important issues affecting PPAs and are not in favour of including them in PPAs.

In the category of operation risks, Kruskal-Wallis tests show that the null hypothesis that there is no significant difference in the perceptions of the stakeholders regarding the significance of the clauses is rejected at 5% significance level for all the listed clauses as shown in Table 5. While the significance of operation guarantee clauses has been rated high by the utility, the lenders have rated it as only moderately significant. Mann-Whitney tests show that for the pair of prime stakeholders: utility and sponsors, the null hypothesis that there is no significant difference in the perceptions regarding the significance of the operation risks is rejected at 5% significance level for clause: dispatch rights, with the utility rating it significantly higher than the sponsors; while the perceptions on the significance of other clauses in operations group of risks are accepted. However, for the pair: lenders and sponsors, Mann-Whitney tests show that the null hypotheses are rejected for the clauses: scheduled outages, availability declaration, and maintenance clauses and for the pair: utility and government, it is rejected for the clause: dispatch rights at the same significance level.

Similarly, as shown in Table 5, Kruskal-Wallis tests show that the stakeholders have rejected the null hypotheses that there is no significant difference in the perceptions of the stakeholders regarding the likelihood of inclusion of the category of operation risk clauses at 5% level of significance. The clauses are favoured by the utility and the sponsors while the lenders show moderate likelihood of inclusion of operation clauses in PPAs. Mann-Whitney tests indicate that the prime stakeholders: utility and sponsors have significant differences in their responses in the inclusion of clauses: dispatch rights, scheduled outages, and maintenance. These clauses are favored more by

Table 5. Issues Concerning Operation Guarantees

Significance of Operation Guarantees						
	Means				**Kruskal-Wallis**	
	Lends.	**Spons.**	**Util.**	**Govt.**	**KW**	**Sig.**
Dispatch rights clauses	3.64	3.89	4.59	3.72	**19.07**	**0.00**
Scheduled outages	3.32	4.29	4.59	4.11	**30.01**	**0.00**
Availability declaration	3.68	4.39	4.73	4.33	**27.09**	**0.00**
Maintenance clauses	3.41	4.43	4.73	4.67	**53.26**	**0.00**
Likelihood of Inclusion of PPAs						
Dispatch rights clauses	3.77	4.18	4.80	3.40	**32.69**	**0.00**
Scheduled outages	3.32	4.25	4.70	4	**29.83**	**0.00**
Availability declaration	3.68	4.36	4.60	4	**22.90**	**0.00**
Maintenance clauses	3.45	4.18	4.80	4.60	**31.25**	**0.00**
Dispatch rights clauses	3.77	4.18	4.80	3.40	**32.69**	**0.00**
Significance of Operation Guarantees – Mann-Whitney						
	Spons. vs. util.		**Lends. vs.spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Dispatch rights clauses	**148**	**0.001**	256.50	0.274	**92**	**0.003**
Scheduled outages	238	0.121	**115**	**0.00**	116	0.026
Availability declaration	213	0.032	**136.50**	**0.00**	136	0.095
Maintenance clauses	224	0.057	**111.50**	**0.00**	186	0.757
Likelihood of Inclusion in PPAs–Mann-Whitney						
	Spons. vs. util.		**Lends. vs. spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Dispatch rights clauses	**167.50**	**0.00**	**213**	**0.042**	**33.50**	**0.00**
Scheduled outages	**216**	**0.04**	**138.50**	**0.001**	**78**	**0.001**
Availability declaration	236	0.11	**152**	**0.001**	**100**	**0.007**
Maintenance clauses	142	0.00	**172.50**	**0.004**	**155**	**0.251**

Note: Bold figures denote responses significantly different at 5% level of significance

the utility than the sponsors. For the pair: lenders and sponsors, the null hypotheses are rejected for all the clauses regarding the operation group of clauses and for the pair: utility and government, the null hypotheses are rejected for the clauses: dispatch rights, scheduled outages, and available guarantees and accepted for maintenance clauses at 5% significance level. Responses show that dispatch right, scheduled outages, availability declaration and maintenance clauses have been rated as significant by the utility and are very likely to be included in PPAs. The lenders have rated operation clause as being less significant than other stakeholders. The utility is in favour of including these clauses.

The clauses rated significant and likely to be included in PPAs are:

- Sponsors: Scheduled outages, availability declaration, maintenance clauses
- Utility: Dispatch rights, scheduled outages, availability declaration, maintenance clauses
- Government: Scheduled outages, availability declaration, maintenance clauses

In issues regarding the importance of dispute resolution and insurance clauses, Kruskal-Wallis test in Table 6 shows that the null hypothesis that there is no significant difference in the responses of the stakeholders is rejected at 5% level of significance for clause: informal dispute resolutions, while the clauses for arbitration, insurance before RCOD and insurance after RCOD are all accepted at the same level of significance. The clauses pertaining to dispute resolution and insurance are rated significant by the stakeholders. Further Mann-Whitney tests show that for the prime stakeholders: sponsors and the utility, there is a significant difference in the clause: informal dispute resolution while the null hypotheses are accepted for the other clauses. For the pair: lenders and the sponsors, there is no significant difference in the responses at 5% level of significance and for the pair: utility and government, there is a significant difference in the clause informal dispute resolution at same level of significance.

Similarly, in the issue of likelihood of inclusion of the dispute resolution and insurance clauses, Kruskal-Wallis tests show that there is significant difference in the responses of the stakeholders regarding the clauses informal dispute resolution, arbitration, and insurance before RCOD. While the clauses are favour by the utility and the sponsors, it is rated as moderately likely to be included by the government. Mann-Whitney tests show that for the pair lenders vs. sponsors, there is a significant difference in the responses regarding insurance clauses. The lenders clearly favour the insurance clauses more than the sponsors. Similarly between the pair of the utility and the government

Table 6. Other Risk Mitigating Guarantees

Significance of Other Risk Mitigating Guarantees						
	Means				**Kruskal-Wallis**	
	Lends.	**Spons.**	**Util.**	**Govt.**	**KW**	**Sig.**
Informal dispute boards	3.77	3.89	4.41	3.56	**17.10**	**0.001**
Arbitration	4.27	4.29	4.73	4.11	7.146	0.067
Insurance before RCOD*	4.32	3.89	4.14	4.22	4.434	0.214
Insurance after RCOD**	4.45	4.18	4.23	4.50	3.142	0.37
Likelihood of Inclusion of PPAs						
Informal dispute boards	3.82	4.00	4.60	3.70	**18.45**	**0.00**
Arbitration	4.27	4.36	4.90	3.90	**23.05**	**0.00**
Insurance before RCOD*	4.41	3.93	4.00	3.90	**8.318**	**0.04**
Insurance after RCOD**	4.50	4.11	4.40	4.30	4.967	0.174
Significance of Other Risk Mitigating Guarantees - Mann-Whitney						
	Spons. vs. util.		**Lends. vs. spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Informal dispute boards	**185**	**0.007**	277.50	0.517	**65.00**	**0.00**
Arbitration	212	0.033	302.00	0.899	116.00	0.026
Insurance before RCOD*	257.50	0.289	213.00	0.036	191.50	0.861
Insurance after RCOD**	295.50	0.792	245.50	0.179	162.00	0.338
Likelihood of Other Risk Mitigating Guarantees Inclusion in PPAs						
	Spons. vs. util.		**Lends. vs. spons.**		**Util. vs. govt.**	
	U-test	**Sig. P**	**U-test**	**Sig. P**	**U-test**	**Sig. P**
Informal dispute boards	**165**	**0.00**	272.00	0.45	**58.50**	**0.00**
Arbitration	**171**	**0.002**	303.00	0.914	**43.00**	**0.00**
Insurance before RCOD*	308	1.00	**198.00**	**0.018**	189.00	0.819
Insurance after RCOD**	234.5	0.10	**213.00**	**0.041**	181.50	0.657

Notes: Bold figures denote responses significantly different at 5% level of significance
* Insurance during construction phase
** Insurance during operation phase

there are significant differences in the responses regarding informal dispute resolution and arbitration clauses with the utility favouring the clauses more than the government.

The informal dispute resolution clauses have been rated important by the utility while the arbitration clause has been rated as important by all the stakeholders. The stakeholders favour the inclusion of the dispute resolution clauses and insurance clauses.

The clauses rated significant and likely to be included in PPAs are:

- Sponsors: Arbitration, insurance after RCOD
- Utility: Arbitration, informal dispute resolution, insurance after RCOD, insurance before RCOD
- Lenders: Arbitration, insurance before RCOD and insurance after RCOD

CONCLUSION

In negotiating PPAs, the parties are expected to strive for inclusion of clauses which they rate as highly significant and as highly likely to be included in PPAs, and to exclude the clauses they rate as highly significant and highly unlikely to be included in PPAs. The clauses that will be most difficult to negotiate will be the ones in which the differences between the negotiating parties as shown by Kruskal-Wallis and Mann-Whitney test are the biggest.

From the results of the survey as shown in Table 7, it can be seen that take or pay clause, and sales of excess revenue are clauses in PPGs rated very significant with divergent views of the prime stakeholders and will thus be difficult to negotiate in PPAs while supply of minimum contract energy is a clause with similar views of the prime stakeholders and will be relatively easier to negotiate.

Likewise, in FMGs, political rights and buyout clauses are significant clauses with divergent views of the prime stakeholders and natural disaster clause is a clause with similar views.

In the issues of FFGs, escalation clause, tax holidays and concessional funding are significant clauses with divergent views of the prime stakeholders.

In operational guarantees, dispatch rights, scheduled outages, availability declaration and maintenance clauses all are significant clauses with similar views of the prime stakeholders.

In dispute resolution methods and insurance issues, informal dispute resolution and insurance before RCOD are

Table 7. Clauses Rated Significant and in Favour of Inclusion in PPAs

	Sponsors	Utility	Comments
PPG	Take or pay		Divergent views
	Sales of excess energy		Divergent views
	Supply of min. contract	Supply of min. contract	Similar views
FMG	Political risks		Divergent views
	Natural disaster risks	Natural disaster risks	Similar views
		Buyout clauses	Divergent views
FFG	Escalation		Divergent views
	Tax holidays		Divergent views
	Conc. funding		Divergent views
Oper. G	Dispatch rights	Dispatch rights	Similar views
	Scheduled outages	Scheduled outages	Similar views
	Availability declaration	Availability declaration	Similar views
	Maintenance clauses	Maintenance clauses	Similar views
Other risk mitigating measures		Informal dispute resolution	Divergent views
	Arbitration	Arbitration	Similar views
		Insurance before RCOD	Divergent views
	Insurance after RCOD	Insurance after RCOD	Similar views

significant clauses with divergent views of the prime stakeholders.

The parties can use the results of the survey to evaluate the positions of the other party and to present suitable alternatives to the negotiated agreement. The parties can also make trades in clauses to create a win-win situation. For example, in FMGs, the sponsor's are in favour of inclusion of the political risks clause while the utility is in favour of inclusion of buyout clauses. The parties can make trades to include both the clauses creating a win win situation. Similarly, clauses where the parties have equal interests can be used to create a favourable environment of negotiations.

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