

## EPC/TURNKEY CONTRACT, LUMPSUM FIXED PRICE SUBJECT TO ADJUSTMENTS

Oleh :

**Sarwono Hardjomuljadi**

sarwonohm2@yahoo.co.id

Civil Engineering Department, Faculty of Engineering, University of Mercu Buana  
Jakarta, Indonesia

**Abstract :** The most important thing before starting the construction project is deciding the type of contract will be used for the project's implementation. In order to get the proper decision, the understanding on various conditions of contracts are required. In Indonesia there are many project using the so called "modified" FIDIC Conditions of Contract for EPC/Turnkey Project, but with the incorrect understanding on the reasons of using EPC/Turnkey Contract, so instead of solving the problem it may caused bigger problems in practice, many problems raised during the execution due to such incorrect understanding of the spirit of EPC/Turnkey Contract. Most of Employers, in this case the government institution or state owned enterprises in Indonesia, choose the EPC/Turnkey Contract with minimum understanding of the essence of the EPC/Turnkey Contract. Their reasons of choosing the EPC/Turnkey Contract was the "tied schedule" and the "higher certainty of cost". FIDIC EPC/Turnkey Contract based on the discussion in this paper, instead of fit the Employer's need only, the EPC/Turnkey Contract still give chance to the contractor to submit their claim (Clause 20) and even the price is fixed, payment could be made once the claim is accepted (Sub-Clause 17.4) means that additional to the contract price can be done. One of the important noteworthy thing is that if there is additional cost it should be "added to the contract price", while in the conventional contract it should be "included in the contract price", so the final price will be the same (Sub-Clause 14.1).

Keyword: EPC/Turnkey Contract, tied schedule, higher certainty of cost, added, included.

### MATERIALS AND DISCUSSION

#### 1. General

The claims and disputes occurred in the construction of State Electricity Corporation's coal power plants in Indonesia were mostly due to the lack of deeper understanding on the spirit of EPC/Turnkey Contract as the conditions of contract to be used and were not due to the use of certain conditions of contract itself. However, many Indonesian higher ranking officials think that the use of standardized conditions of contract such as FIDIC Conditions of Contract in this case the FIDIC CC for Construction is the main causal factor of the claim and using the such FIDIC Conditions of Contract is more the

contractor's advantages. This misperception makes them hesitate to use the FIDIC Conditions of Contract for Construction and move to FIDIC Conditions of Contract EPC/Turnkey Project which is in their opinion will be more fix in term of contract price. Most of decision makers in Indonesia State Electricity Corporation (PLN) have only a little or even no knowledge on the spirit of FIDIC EPC/Turnkey Contract. That is why they choose to develop coal power plant in Indonesia by using their own standard conditions of contract which is actually the modified FIDIC Conditions of Contract for EPC/Turnkey Project.

## **2. FIDIC GCC for EPC/Turnkey Project and FIDIC GCC for Construction.**

Clauses related to the difference between EPC and Construction Contract are as follows:

### **2.1. The Contract Price**

#### **Sub-Clause 14.1 The Contract Price (Silver Book)**

Unless otherwise stated in the Particular Conditions:

- (a) payment of the Works shall be made on the basis of the lump sum Contract Price, subject to adjustments in accordance with the Contract; and
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract, and the Contract Price shall not be adjusted for any of these costs, except as stated in Sub-Clause 13.7 [Adjustments for Changes in Legislation].

*(Conditions of Contract for EPC/Turnkey Projects -1999)*

#### **Sub-Clause 14.1 The Contract Price (Red Book)**

- (a) the Contract Price shall be agreed or determined under Sub-Clause 12.3 [Evaluation] and be subject to adjustment in accordance with the Contract.
- (b) the Contractor shall pay all taxes, duties and fees required to be paid by him under the Contract and the Contract Price shall not be adjusted for any of these costs except as stated in Sub-Clause 13.7 [Adjustment for Changes in Legislation];
- (c) any quantities which may be set out in the Bill of Quantities or other Schedules are estimated quantities and are not to be taken as the actual and correct quantities:

(i) of the Works which the Contractor is required to execute, or

(ii) for the purposes of Clause 12 [Measurement and Evaluation]; and

*(Conditions of Contract for Construction-1999 and MDB Harmonised Edition-2006)*

The above clauses show that the "spirit" of EPC Contract (Silver Book) is a fixed "lump sum" contract price, while the Construction Contract (Red Book) is a "dynamic" contract price.

### **2.2. Consequences of Employer Risks (Silver Book)**

#### **Sub-Clause 17.4 Consequences of Employer Risks**

If the Contractor suffers delay and/or incurs Cost from rectifying this lost or damage, the Contractor shall give a further notice to the Employer and shall be entitled subject to Sub Clause 20.1 [Contractor's Claim]

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub clause 8.4 [Extension of Time for Completion]; and
- (b) payment of any such Cost, which "shall be added to" the Contract Price.

*(Conditions of Contract for EPC/Turnkey Project-1999)*

#### **Sub-Clause 17.4 Consequences of Employer Risks (Red Book)**

If the Contractor suffers delay and/or incurs Cost from rectifying this lost or damage, the Contractor shall give a further notice to the Employer and shall be entitled subject to Sub Clause 20.1 [Contractor's Claim]

- (a) an extension of time for any such delay, if completion is or will be delayed, under Sub clause 8.4

[Extension of Time for Completion]; and  
(b) payment of any such Cost, which “shall be included in” the Contract Price, in the case of sub-paragraph (f) and (g) of Sub-Clause 17.3 [Employer’s Risk], reasonable profit on the Cost shall also be included.

*(Conditions of Contract for Construction-1999 and MDB Harmonised Edition-2006)*

The above sub-clause shows that the Contract Price in FIDIC CC for EPC/Turnkey Contract is “fixed contract price”, means that in case there are some works necessary to be done on completing the Work, such cost “shall be added to the contract price” and not “shall be included in the Contract Price” as for the cost of additional work in the FIDIC CC for Construction. It means that both Conditions of Contract allow the additional contract price, only the way to include that additional in the contract price is treated in different way.

### **2.3. Right to Vary 9 (Silver Book)**

#### **Sub-Clause 13.1 Right to Vary**

Variations may be initiated by the Employer at any time prior to issuing the taking Over Certificate for the Works, either by an instruction or by request for the contractor to submit a proposal. A Variation shall not comprise the omission of any work which is to be carried out by others.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Employer stating (with supporting particulars) that (i) the Contractor cannot readily obtain the Goods required for the Variation, (ii) it will reduce the safety or suitability of the

Works, or (iii) it will have an adverse impact on the achievement of the Performance Guarantees. Upon receiving this notice, the Employer shall cancel, confirm or vary the instruction.

*(Conditions of Contract for EPC/Turnkey Project-1999).*

#### **Sub-Clause 13.1 Right to Vary (Red Book)**

Variations may be initiated by the Employer at any time prior to issuing the taking Over Certificate for the Works, either by an instruction or by request for the contractor to submit a proposal.

The Contractor shall execute and be bound by each Variation, unless the Contractor promptly gives notice to the Employer stating (with supporting particulars) that the Contractor cannot readily obtain the Goods required for the Variation. Upon receiving this notice, the Employer shall cancel, confirm or vary the instruction.

Each Variation may include:

- (a) changes in the quantities of any item of work included in the Contract (however, such change do not necessarily constitute a Variation),
- (b) changes to the quality and other characteristics of any item of work,
- (c) changes to the level, positions and/or dimension of any parts of the Works,
- (d) omission of any work unless it is to be carried out by others,
- (e) any additional works, Plant, Materials or services necessary for the Permanent Works, including any associate Test on Completion, boreholes and other testing and exploratory work or,
- (f) changes to the sequence or timing of the execution of the Works.

*(Conditions of Contract for Construction-1999 and MDB Harmonised Edition-2006)*

It could be seen that the spirit of FIDIC Conditions of Contract for EPC/Turnkey Project (Silver Book) is fixed price providing that there is no change, in the form of instruction or approval in the construction drawings and/or the method of working proposed by the contractor when they submit the revised drawing for implementing the activities, it should be understood that in both, FIDIC Conditions of Contract for Construction (Red Book) of FIDIC Conditions of Contract for EPC/Turnkey Project (Silver), there is possibility of changes in most activities or part of the works.

As an illustration, once the employer paid to the contractor for the additional volume for example the pile foundation, it means the employer indirectly agreed that a variation to the work was instructed, whereas in EPC/Turnkey Contract, there should not be an additional to the Contract Price without changing order to the scope of work or design change.

In the implementation, the approval on construction working drawing means the instruction to proceed the work, since without such approval the work is not allowed to be started.

### **3. EPC/Turnkey Contract for power plants in Indonesia**

The reasons of using EPC/Turnkey Contract for most projects in Indonesia are:

1. Time constraint to complete the project on time since the delay in completion may affect the operation of the premises and

consequently will delay the collecting of the revenue.

2. No design available at that time.

By using the EPC/Turnkey Contract, the Employer thought that they already shift the risks to the contractor side, but EPC/Turnkey Contract with too limited information or too simple basic design would create many problems in the course of the work.

The condition might be worsen since most of conditions of contract for public sector and private sector construction work in Indonesia was "tailor-made" and was not standardized. Instead of controlling the contract price, a modified EPC/Turnkey Contract would create more problems and finally everything became uncontrollable. A "tailor made" contract by deleting and replacing some clauses in the FIDIC Conditions of Contract for EPC/Turnkey Project by newly made clauses for the employer's sake was mostly than none creating the disputes in the future since the contractor would obviously try to minimize the loss.

With such misunderstanding, the owner, in this case the Indonesia State Electricity Corporation constructed their coal power plant projects using the modified FIDIC Conditions of Contract for EPC/Turnkey Project, mostly by deleting the clauses of the employer's obligation and attaching unit prices in the civil works part without any remarks.

**Table 1 Coal Power Plant Projects using EPC/Turnkey Contract in Indonesia (Java Island)**

NO	PROJECT NAME	CAPACITY (MW)	ORIGINAL CONTRACT		REMARK
			USD	IDR	
1	REMBANG CPP, CENTRAL JAVA	2 X 315	353,793,444	2,565,638,698,812	Claim for additional pile foundation for construction jetty.
2	LABUAN CPP, BANTEN	2 X 300	373,427,613	1,538,121,618,046	Claim/ for additional length of break water and jetty.
3	INDRAMAYU CPP, WEST JAVA	3 X 330	766,407,863	1,647,300,023,978	Potential claim for delay of L/C opening (EOT).
4	PAITON CPP, EAST JAVA	1 X 660	428,127,137	777,293,309,275	
5	SURALAYA CPP, BANTEN	1 X 625	367,903,081	951,677,973,128	Claim for additional work for coal yard and coal handling.
6	PACITAN CPP, EAST JAVA	2 X 315	379,469,024	1,353,549,015,500	
7	PELABUHAN RATU CPP, WEST JAVA	3 X 350	623,683,413	2,425,583,521,260	Potential claim for delay of L/C opening (EOT).
8	TELUK NAGA (LONTAR) CPP, BANTEN	3 X 315	588,789,989	2,079,145,339,700	Claim for project safety and damage about incident with local people.
9	TANJUNG AWAR-AWAR CPP, EAST JAVA	2 X 350	480,776,540	1,495,162,036,192	Potential Claim for additional length of

					pile foundation for jetty construction
10	ADIPALA CILACAP CPP, CENTRAL JAVA	1 X 660	605,296,555	2,446,311,697,151	Potential Claim for additional length of pile foundation for jetty construction

**Table 2 Coal Power Plant Projects using EPC/Turnkey Contract in Indonesia (Sumatera Island)**

NO	PROJECT NAME	CAPACITY (MW)	ORIGINAL CONTRACT		REMARK
			USD	IDR	
1	NAGAN RAYA CPP, NANGROE ACEH DARUSSALAM	2 X 110	160,910,505	795,022,169,563	Potential Claim for additional length of pile foundation.
2	PANGKALAN SUSU CPP, NORTH SUMATERA	2 X 220	270,819,993,73	1,010,461,264,161,25	Potential Claim for additional length of pile foundation.
3	BENGGALIS CPP, RIAU	2 X 10	10,911,169,50	171,444,999,913	
4	SELAT PANJANG CPP, RIAU	2 X 7	12,001,083	144,098,063,800	
5	TANJUNG BALAI KARIMUN CPP KEPULAUAN RIAU	2 X 7	8,251,281,50	92,170,796,317,50	Potential claim (change jetty design).
6	LAMPUNG CPP, LAMPUNG	2 X 100	154,273,163	595,100,000,000	Potential Claim for additional length of pile foundation.

7	SUMATERA BARAT CPP, WEST SUMATERA	2 X 112	179,024,152	673,609,315,309	Potential Claim for additional length of pile foundation.
8	No.3 BANGKA BELITUNG CPP, PANGKAL PINANG, BANGKA	2 X 30	29,700,000	410,138,467,860	
9	No 4 BANGKA BELITUNG CPP, BELITUNG	2 X 16,5	30,933,801,8	184,008,788,665,5	
10	LABUHAN ANGIN CPP, NORTH SUMATERA				Claim for additional length of pile foundation.

The above tables show that problem occurred in most of the project was similar, i.e. claim on the additional cost due to the “unforeseeable physical condition” (contractor’s opinion) where it was only the less significant additional volume that should actually be considered by the Contractor before submitting the bid (employer’s opinion). Most of the claim was caused by additional length of the foundation, which actually being done based on the approved working drawing prepare by the Contractor and approved by the Employer.

“Unforeseeable physical conditions” is the contractor’s favorite clause:

The term “Unforeseeable Physical Conditions (UPC)” and the like, is a contractual term specifically used in

most of Standard General Conditions of Contract. The spirit of clause related to “Unforeseeable Physical Conditions” requires the contractor *to observe the site condition from time to time so he is able to find that condition timely*

As an illustration, the length of the pile foundation was 5 meter based on the design (Contractor’s own design, but based on the information given by the employer at the time of tender and/or pre bid conference), but in the implementation, the length of the pile foundation have to be constructed 10 meter deep. In the contractor’s opinion this could be classified as UPC, because their expectation while signing the EPC Contract was exactly 5 meter.

Additional volume: There were two arguable opinions. The lawyer's opinion saying that the additional length of the pile foundation in the above illustration was due to something unforeseeable might be correct. Another opinion saying that it was just a less significant additional volume might be also correct, but no matter what it was, there was no doubt that as the contract was signed it meant that it was understood and agreed by both parties as stipulated in the Sub-Clause 4.12 Unforeseeable Difficulties of the FIDIC CC EPC/Turnkey Project.

**Case 1:**

In the implementation of EPC/Turnkey Contract for a Coal Power Plant Project P, the Contractor was responsible to construct the pier for unloading the coal.

Based on the original design, the length of the pier was X meter but based on the supporting data of the sea level, Contractor A in his bid proposed to reduce the pier length into Y meter, where  $Y < X$  meter which was then agreed by the Employer. Due to that, the bid price submitted by Contractor A was lower than the other contractors.

After the price and technical evaluation, Contractor A was then appointed as the Contractor for the Coal Power Plant Project P to conduct the design, engineering, procurement and construction works including the pier. During the construction, the actual sea water level was lower than predicted by the contractor when preparing the design. The ship was consequently unable to unload and the coal supply would be disrupted.

The Contractor had the schedule of rates and prices attached to the contract, so in order to avoid further failure, the Employer instructed the Contractor to use the former Employer's design. The final price of the pier then became even higher than the original price of the pier with the length of X meter

**Case 2:**

In the construction of a Coal Power Plant Q, the foundation was originally designed using pile foundation with a certain depth, say X meter, but during the execution of the work the hard rock was found deeper, say Y meter where  $Y > X$ .

In the contract, there was schedule of rates and prices attached to the contract for foundation works. It meant that the payment for this work would be based on such unit price.

This showed that the Employer did not fully understand the spirit of an EPC/Turnkey Contract which was actually a Lump Sum Fixed Price Contract as they also included Unit Price work in the Contract.

The final Contract Price increased since the substantive principle of an EPC/Turnkey Contract had been abandoned due to the lack of understanding on EPC/Turnkey Contract.

FIDIC Conditions of Contract is an engineered conditions of contract required by the international lending institution, unfortunately there is a misperception in the employer side that the use of FIDIC Conditions of Contract facilitates the contractor in submitting their claims which used to create disputes. In the writer's opinion the spirit of equality between



employer and contractor should not allow such misperception. The clause allowing the contractor to submit claim and the clause of Unforeseeable Physical Conditions and the like are the entry gate for the contractor to recover their loss.

#### **4. Unforeseeable Conditions**

The term "Unforeseeable Physical Conditions (UPC)" and the like, is a contractual term specifically used in most of Standard General Conditions of Contract. The spirit of clause related to "Unforeseeable Physical Conditions" requires the contractor *to observe the site condition from time to time so he is able to find that condition timely.*

#### **Sub-Clause 4.12 Unforeseeable Difficulties**

Except as otherwise stated in the Contract:

- (a) the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works;
- (b) by signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; and
- (c) the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.

*(Conditions of Contract for EPC/Turnkey Project-1999)*

In Clause 4.12 of Conditions of Contract for EPC/Turnkey Project-1999, it is clear that principally no "unforeseen conditions" is allowed

since once the contract is signed then Sub-Clause 4.12(b) becomes valid.

The decision makers think that the UPC clauses are the main causal factor of claims and therefore suggest that the clauses to be eliminated, whereas the existence of clauses emphasizing adjustment of the contract price and/or extension of time if unexpected circumstances occurred would reduce the contingency costs or hidden risk taking into account by the contractor in his tender calculation. Those clauses are based on the assumption that if the contractor obtains adjustment of the contract price and/or extension of time when encountering the Unforeseeable Physical Conditions (UPC), the contractor should not consider the risk allocation in their tender price. Since the risks allocated by every contractor vary largely, it will be easier in evaluating the submitted tender if the risk allocations are not included and therefore the price submitted will be a realistic one.

The hesitation to allow the UPC Clauses makes the EPC/Turnkey Contract the employer's first choice, considering that all risks will be fully shifted to the contractor. There is a tendency in Indonesia using the EPC/Turnkey Contract instead of the Conventional Construction Contract.

Example clauses related to Unforeseeable Physical Conditions from some General Conditions of Contract are as follows:

#### **Clause 12.2. Not Foreseeable Physical Obstruction or Conditions.**

If however, during the execution of the Works the Contractor encounters physical obstruction or physical

conditions, other than climatic conditions on the Site, which obstruction or conditions were, in his opinion, not foreseeable by an experienced contractor, the Contractor shall forthwith give notice thereof to the Engineer.....”  
*(FIDIC General Conditions of Contract for Works of Civil Engineering 4<sup>th</sup> Edition, 1987, amended 1992)*

#### **Clause 4.12 Unforeseeable Physical Conditions**

In this Sub-Clause “physical conditions” means natural physical conditions and man made and other physical obstructions and pollutants, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions.

If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Engineer as soon as practicable.

*(FIDIC General Conditions of Contract for Construction, 1<sup>st</sup> Edition 1999 and MDB Harmonised Edition 2006)*

#### **Clause 12.1 Latent Conditions**

Latent conditions are:

Physical conditions on the Site and its near surrounds, including artificial things but excluding weather conditions, which differ materially from the physical conditions which should reasonably have been anticipated by a competent Contractor at the time of the Contractor’s tender, if the Contractor has inspected:

- a) all written information made available by the principal to the contractor for the purpose of tendering
- b) all information influencing the risk allocation in the Contractor’s tender and reasonably obtainable by the

making of reasonable enquiries; and

c) the site and its near surrounds  
*(Standards Australia: General Conditions of Contract AS 4000-1997, amendment 3-2005)*

#### **Clause 5.2 Adverse Physical Condition**

If the Contractor shall encounter adverse physical conditions (other than weather conditions or effects due to weather conditions on the Site) in the course of carrying out sub-surface works, which adverse physical conditions could not have been reasonably foreseen by an experienced contractor and the Contractor is of the opinion that additional cost will be incurred.....”

*(Building and Construction Authority of Singapore: Public Sector Standard Conditions of Contract for Construction Works 5<sup>th</sup> Edition, 2006)*

#### **Clause 4.3.4 Claims for Concealed or Unknown Conditions**

If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical condition which differ materially from those indicated in the Contract Document or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Document .....

*(American Institute of Architect: General Conditions of the Contract for Construction A201-1997)*

There are “unforeseen conditions” in many contracts with their own definition respectively, but for the EPC/Turnkey, Sub-Clause 4.12 is bound. So no claim on the unforeseeable physical conditions are

allowed. But, the contractor still possible to receive additional payment if there are instruction and/or approval on the variations proposed by the contractor.

It should be noted that the contract price while using the EPC/Turnkey Contract might be higher than using the Construction Contract, but in case that the allocation of time and cost are limited EPC Contract might be the best. Another reason for using EPC in Indonesia is the certainty of cost which is better than the uncertain cost with huge additional cost and in order not to be suspected especially by the Anti Corruption Committee, the government super body to fight against the corruption.

By using EPC Contract the chance to submit the claim is very limited. Once the contractor signed the contract means they accept any site conditions and the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs.

Eventhough there is no adjustment to the Contract Price in the Conditions of Contract EPC/Turnkey Project, there is still chance for the contractor to submit claim in accordance to Clause 20 and by the existence of Sub-Clause 13.1 Right to Vary, where mentioned variations may be initiated by the Employer at any time prior to issuing the Taking Over Certificate for the Works, either by an instruction or by request for the contractor to submit a proposal and Sub-Clause 17.4 Consequences of Employer Risks where mentioned that that the contractor shall be entitled subject to Sub Clause 20.1 [Contractor's Claim], for an extension of time for any such delay, if completion is or will be

delayed, under Sub clause 8.4 [Extension of Time for Completion]; and payment of any such Cost, which "shall be added to" the Contract Price. FIDIC Conditions of Contract for EPC/Turnkey Project could be categorized as the fair conditions of contract not only for the contractor but also for the employer. On choosing the EPC/Turnkey Contract, employer should realize that since there are more risks allocated to the Contractor, the contractor will require more data on site conditions site including sub-surface condition and need more time to study the risks before submitting the tender.

Learning from the experiences in Indonesia the use of "tailor made" EPC/Turnkey Contract by modifying several clauses should be avoided, but it should be mandatory of using the original version of FIDIC Condition of Contract EPC/Turnkey Project along with the translation from the English version to Bahasa Indonesia which is published under FIDIC license as the supporting tools to deeply understand the spirit of FIDIC Conditions of Contract for EPC/Turnkey Project.

Another advantage for the employer by using the EPC/Turnkey Contract is that the owner only needs to put in minimum efforts in his project as the cost is already known at the beginning of the project. Market cost fluctuation has an important influence to the contractor side as there is no price escalation clause in an EPC Contract. That is why the contractor has to pay attention to the currency exchange and price variation of materials and labor in the market. All variations in cost are considered as the contractor's risks since by an EPC Contract means

that both parties have committed a fixed price and it will be free from variation of the market prices. It should be considered an arrangement of a re-agreement between the contractor and the suppliers in order to protect the contractor's performance.

The Employer should remember that the Conditions of Contract for EPC/Turnkey Projects are not suitable for use in the following circumstances:

- o If there is insufficient time or information for tenderers to scrutinise and check the Employer's Requirements or for them to carry out their designs, risk assessment studies and estimating (taking particular account of Sub-Clauses 4.12 and 5.1).
- o If construction will involve substantial work underground or work in other areas which tenderers cannot inspect.
- o If the Employer intends to supervise closely or control the Contractor's work, or to review most of the construction drawings.
- o If the amount of each interim payment is to be determined by an official or other intermediary

## CONCLUSION

1. Both FIDIC CC for EPC/Turnkey and FIDIC CC for Construction allowed the additional contract price.
2. FIDIC CC for EPC/Turnkey not suitable for underground works
3. In FIDIC CC for EPC/Turnkey the issuance of construction working drawings mean the instruction, so if there are differences from the original drawings, it could be classified as variation order.

## References

1. **American Institute of Architect:** "General Conditions of the Contract for Construction A201", 1997
2. **Building and Construction Authority of Singapore:** "Public Sector Standard Conditions of Contract for Construction Work" 5<sup>th</sup> Edition, 2006
3. **Bunni, Nael G.,** "The FIDIC Forms of Contract", Blackwell Publishing, 3<sup>rd</sup> Edition, 2008
4. **Chow, Kok Fong,** "Construction Contracts Dictionary", Sweet & Maxwell Asia, 1<sup>st</sup> Edition, Singapore, 2006
5. **FIDIC,** "General Conditions of Contract for Civil Engineering Works", 4<sup>th</sup> Edition, Geneva, 1987, amended 1992
6. **FIDIC,** "General Conditions of Contract for Construction", 1<sup>st</sup> Edition, Geneva, 1999
7. **FIDIC,** "General Conditions of Contract for EPC/Turnkey Project, 1<sup>st</sup> Edition, Geneva, 1999
8. **FIDIC,** "General Conditions of Contract for Construction, MDB Harmonised Edition, 1<sup>st</sup> Edition, Geneva, 2006
9. **Garner, Bryan A.,** "Black's Law Dictionary", Thomson West, St. Paul, 2004
10. **Hardjomuljadi, Sarwono,** "Pre Contract Strategy for Minimizing Construction Claims Impact on Hydro Electric Power Plant Projects in Indonesia" , Tarumanagara University, Jakarta, 2009
11. **Hardjomuljadi, Sarwono,** "The Metamorphosis of FIDIC GCC Clauses and the Main Causal Factors of Construction Claims in Indonesia", Paper Presented at FIDIC Asia-Pacific Contract Users' Conference, Hong Kong, 29-30 June 2009
12. **Hardjomuljadi, Sarwono; Abdulkadir, Ariono and Takei,**

- Masaru**, “Construction Claim Strategy based on FIDIC Conditions of Contract”, ISBN:979-97749-2-6, Polagrade, Jakarta, 2006.
13. **Indonesia State Electricity Corporation**, **Electricity Projects Information**, 2010
14. **Martin, Elizabeth A. and Law, Jonathan**, “Dictionary of Law”, Oxford University Press, New York, 2007
15. **Standards Australia**: “General Conditions of Contract AS 4000-1997”, amendment 3-2005