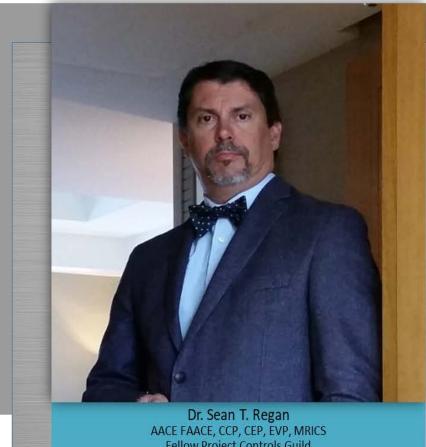


Project Controls Expo – 22nd November 2018 Melbourne Cricket Ground

International Application: Estimating Differences Russian and International Projects



Sean T Regan, Ph.D., FAACE, CCP, CEP, **EVP, PSP, MRICS, FPCG**



Fellow Project Controls Guild

Certifications / Affiliations

- Association Advancement of Cost Engineers Fellow AACE; Full Member; Certified Cost Professional, Certified Estimating Professional; Earned Value Professional; OT Zimmerman Award, Director Region 9 AACE, AACE Educational Board for Chairman International Marketing Committee Co-Chair International Annual Meetings Committee, Co-Chair International Government, Co-Chair Eastern European Committee, 2016/17 Outstanding Regional Director
- American Conference Construction Educators member-Industry Advisory Board
- ICEC Region 2 Co-Marketing Director
- College of Performance Management
- MRICS Chartered Surveyor
- Fellow Project Controls Project Controls Guild



Dr. Sean T Regan - Biography

• Education:

- BS Construction Management Long Beach State
- MS Management & Administration Central Michigan University
- Ph.D. Engineering Management Columbus University
- Employment: 35 Years Experience in Project Controls and Management
 - President International Operations OnTrack Engineering Nov 2016 to Current
 - Lead Manager Project Controls RAOS OY Aug 2018 to Current
 - Sr. Project Controls Manager and Project Manager AECOM KZ Jul 2015 to Nov 2016
 - Business Manager Jacobs Feb 2013 to Jul 2015
- Professional Certifications:
 - Fellow, Certified Cost Professional, Estimating Professional, Earned Value Professional, Planning & Scheduling Professional – AACE
 - Fellow Project Controls Guild
 - Charted Surveyor MRICS Royal Institute Charter Surveyors



Dr. Sean T Regan - Biography

Years	Employer	Position
2016 – Present	OnTrack Engineering	President International Operations
2010 – Present	LGM International	President
1990-2016 (28 Years Experience in Project Controls and Management)	Employers including: AECOM, Jacobs Engineering, USM School of Construction, IHI E&C International, Kvaerner, IMTC-MEI, ConocoPhillips Russia Caspian, Parsons Iraq, KBR PCO Oil Iraq, Krump Construction, KDG, Bechtel International	Sr. Project Controls Engineer, Project Controls Manager, Business Manager Visiting Professor, Technical Manager, Vice President International Operations, Project Services Manager, EVMS Manager, Project Manager



Estimating Differences Russian and International Projects

International Projects and Russian projects are coming to a point where the differences in standards between Russia and International projects has become not just a viable talking point, but a critical need due to the current geopolitical and economic positions of programs.

- Estimator Career Development
- Work Breakdown Structure (WBS)
- Estimating Methodological Differences
- Estimate Development
- Estimate Direct Rate Development
- Estimate Indirect Development
- Estimate Contingency



Differences Explained

International Estimator – Career Development



Educational Development

Degree: BS in Construction Management or Engineering Accredited Program (American Conference Construction Educators-ACCE) has following course outlines if a Candidate is Estimating or Management:

- Est 1 Principals of Estimating

 48 Hours 3 Credit Units –
 Prerequisite Construction Practices
- Est 2 Intermediate Estimating 48 Hours 3 Credit Units –
 Prerequisite Planning & Scheduling
- Est 3 Advanced Estimating 48 Hours 3 Credit Units –
 Prerequisite Cost Control, BIM, Construction Law
- Total Hours in Estimating 144 Hours 9 Credit Units + 90 days experience or a Certified Cost or Schedule Technician



Alignment to International Certification

AACE Certifications

Technician Certifications – 4 Years Education or Experience – No renewal

Certified Cost Technician (CCT)

Certified Scheduling Technician (CST)

Expert Certifications – 4 years Education and/or 4 years Experience = 8 Years – Renewal Every 3 years by exam or professionalism

Certified Cost Professional (CCP)

Planning and Scheduling Professional (PSP)

Earned Value Professional (EVP)

Certified Estimating Professional (CEP)

<u>Key – there is no Technician for Estimating – Professionally Estimators require</u> <u>experience in International. Company Programs normally provide experience</u>



Alignment to International Certification

Traditional Rotation Programs – Hire a Graduate or Transfer a Engineer into Project Controls:

For Estimating Career 4 Years: Planning or Cost Career— 3 Years

1 Year in Planning and Scheduling 1 Year Estimating

1 Year in Cost Control 1 year Planning

Years 3 & 4 are in Estimating 1 Cost Control

Jr. Estimators – 1 to 5 Years Experience

Estimator – 5 to 10 Years Experience

Principal or Sr. Estimator – 10 Years + Experience

Director Estimating – 15 to 20 Years of Experience



System Development - Procedures

Estimating Procedures are summary level for items:

In International, we do not have step by step – based on the education and experience.

Why?

As estimators are controlled by companies in different ways and each project is different, the procedures state what is expected. The Plan then states the original assumptions.

Basis of Estimate is the detail in which they do the work. There are no Norms, laws, regulatory and each project is different, they are aligned, in some cases maybe dropped if not enough information and allowances are done.



Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) is the hierarchical decomposition of the scope of work into a parent to child relationship that roles up and down. It is a deliverable based decomposition of the scope of work into manageable sections.

The Cost Breakdown Structure (CBS) is a <u>cost allocation</u> to the lowest level of the <u>Work Breakdown Structure (WBS)</u>. The CBS is a breakdown of the costs of the various components of the structure including all works or services done by the subcontractors. The CBS is used to continuously compare the actual costs with the budget, and integrate to the cost control system.



Russian Work Breakdown Structure (WBS)

In many Russian Systems the WBS has been assigned such as — 6 Levels of the WBS and then a Separate 5 Levels of CBS

1	2	3	4	5	6
	Class of	Set of	Groups of		
Project	Estimate	facilities	facilities	Facilities	Discipline



Russian Cost Breakdown Structure (CBS)

CBS – called a Level 2 Structure

5	6	7	8	9
	_	_		
Category	Group of	Subgroup	Cost	Subitems
of costs	costs	of costs	items	of costs

Issue – this structure is not a WBS by International Associations such as AACE, ACostE, DACE, APM, RICS, ICEC – they also attempted to use the ICMS as a Separate Structure



Issue Russian WBS/CBS

Issue – this structure is not a WBS by International Associations such as AACE, ACostE, DACE, APM, RICS, ICEC – they also attempted to use the ICMS as a Separate Structure.

- 1) WBS is one relationship process not two
- CBS is lowest level of WBS, cost collection of elements, not a separate
- Estimate Classification is not a Deliverable but a benchmark or level of review

International WBS

21			BUILDINGS AND STRUCTURES AT THE PLANT SITE
			CODE 21 CUMULATIVE COSTS
21	.01		Site Preparation Facilities, Infrastructures
21	.01	.01	Land reclamation (biological reclamation excluded), clearing and grading
21	.01	.06	Landscaping
21	.01	.07	Gateways, security installations, gatehouses, ect.
21	.01	.08	Fencing (permanent, excluding gas mitigation system)
21	.01	.09	Modifications and demolitions (if applicable) to existing facilities at the Construction Site, including its permitting
21	.01	.11	Other infrastructures
21	.02		Reactor building (including containment)
21	.02	.01	Excavation, Backfilling and all related work
21	.02	.02	Foundation, such as plates, piles, caissons, substructure concrete and other materials
21	.02	.03	Superstructure, including inner and outer concrete structures, other inner structures, structural steel and other materials.
21	.02	.04	Special shielding inside reactor building isolated from normal concrete walls and not an integral part of components
21	.02	.05	Building service systems, insofar as they form an integral part of civil works
21	.02	.06	Cable and pipe ducts connecting the reactor building with other buildings
21	.02	.07	Containment, i.e. free standing steel containment, concrete containment including steel liner, caissons; airlocks for personnel, materials or emergency; piping and electrical penetrations are included
21	.02	.08	Severe accident core catcher structures



International WBS

ОТРАСЛЕВЫЕ СМЕТНЫЕ НОРМАТИВЫ

ОТРАСЛЕВЫЕ ЕДИНИЧНЫЕ РАСЦЕНКИ НА СТРОИТЕЛЬНЫЕ И СПЕЦИАЛЬНЫЕ СТРОИТЕЛЬНЫЕ РАБОТЫ НА ОБЪЕКТАХ АТОМНОЙ ЭНЕРГЕТИКИ

OEP-2001

Часть 6 БЕТОННЫЕ И ЖЕЛЕЗОБЕТОННЫЕ КОНСТРУКЦИИ МОНОЛИТНЫЕ

Часть 7 БЕТОННЫЕ И ЖЕЛЕЗОБЕТОННЫЕ КОНСТРУКЦИИ СБОРНЫЕ

Часть 9 СТРОИТЕЛЬНЫЕ МЕТАЛЛИЧЕСКИЕ КОНСТРУКЦИИ INDUSTRY ESTIMATED
STANDARDSINDUSTRIAL ONLY PRICES
FOR CONSTRUCTION AND SPECIAL
CONSTRUCTION WORKS ON ATOMIC
ENERGY SITES

OEP-2001

Part 6 - CONCRETE AND CONCRETE STRUCTURES MONOLITHIC

Part 7 - CONCRETE AND CONCRETE STRUCTURES CONSTRUCTION

Part 9 - BUILDING METAL CONSTRUCTIONS

http://www.minstroyrf.ru/trades/view.industry.php

Macana 2006

3



Estimating Methodological Differences: Russian Calculations

Rates and Normative are developed based on the GOST (Russian Government Standards)

Измеритель: 100 м3 железобетона в деле

Meter: 100 m3 of reinforced concrete in the case

Укладка бетона В 15 (М 200) в сборные блок-ячейки при возведении сборно-монолитных железобетонных стен:

Concrete laying in 15 (M 200) in prefabricated block-cells at erection of precast-monolithic reinforced concrete walls:

реакторного отделения автобетононасосом и кранами СКР Reactor compartment of the autopump and the cranes of the SKr

Измеритель:	100 m ³	железобетона в деле	
-------------	--------------------	---------------------	--

Укладка бетона В 15 (М 200) в сборные блок-ячейки при возведении сборно-монолитных железобетонных стен:

	CICH.						
06-01-141-05	реакторного отделения						
	автобетононасосом и кранами						
	CKP						
	(зона: 1)	132236,35	5101,95	63644,78	3237,86	63489,62	565
	(зона: 2)	189872,00	5785,60	79823,21	3665,90	104263,19	565
	(зона: 3)	159790,75	10316,90	68046,43	6543,99	81427,42	565
	(зона: 4)	144763,05	5440,95	66433,79	3450,56	72888,31	565
	(зона: 5)	152504,25	5260,15	65419,64	3337,65	81824,46	565



Estimating Methodological Differences: International Calculations

Method #1: Factor

Method #2: Bill of Quantity

Method #3: Material Take Off (MTO)

Method #4: Unit Price

Method #5: Productivity Estimate

Method #6: Take Off Estimate

NOTE: Estimator is responsible for the choosing to appropriate method to make the estimation on his discipline



Estimating Methodological Differences: Russian Rate Development

Rates and Normative are developed based on the GOST (Russian Government Standards)

1000_ОЕР Росатом без разбивки (с исправ на 10.12.09)_ \triangle В том числе, руб. Наименование и характеристика расценок строительных работ и конструкций эксплуатация машин материалы Затраты Прямые оплата труда в т.ч. затраты, Коды Наименование и характеристика расход труда рабочих. оплата руб. неучтенных неучтенных расценками материалов, всего неучтенных рабочих чел.-ч труда

Подраздел 1.22 КОНСТРУКЦИИ ЗДАНИЙ АТОМНЫХ ЭЛЕКТРОСТАНЦИЙ

Таблица 06-01-140. Устройство фундаментной плиты под здания реакторного отделения АЭС с реактором ВВЭР 1000

	Измеритель: 100 м ³ бетона						
06-01-140-01	Устройство бетонной подготовки						
953 964 0 9959 (0000 9660 0 9490)	под фундаментную плиту здания						
	реакторного отделения из бетона						
	В 7,5 (М 100) автобетононасосом						
	(зона: 1)	60402,44	1544,13	5649,00	386,40	53209,31	171
	(зона: 2)	96331,61	1751,04	7073,64	437,60	87506,93	171
	(зона: 3)	77560,55	3122,46	6139,88	780,85	68298,21	171
	(зона: 4)	68663,28	1646,73	5900,06	411,84	61116,49	171
				'	9,31	68632,71	171
	Измеритель /// Электроі	нная поч	та 🗘	Сохран	ИТЬ		
06-01-140-02	Установка ар		- -	o o x p ai i			
	фундаментную плиту под здание						

Zones:

- 1) voronezh region
- 2) kaliningrad region
- 3) leningrad region
- 4) rostov region
- 5) tverskaya region



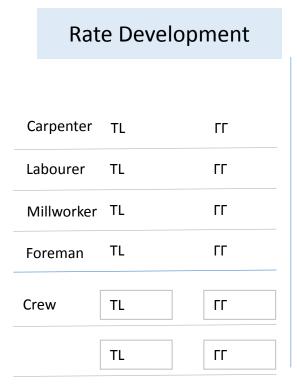
реакторного отделения краном

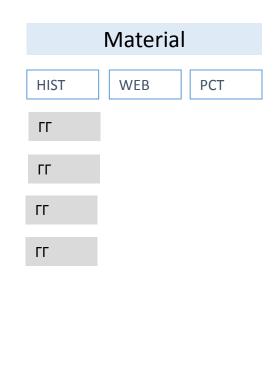
единица измерения

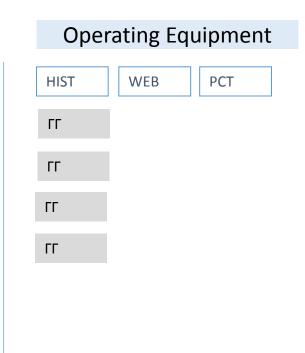
материалов

материалов

Estimating Methodological Differences: International Rate Development







Estimating Methodological Differences: International Rate Development

Development Rates:

Labour Rates:

Craft Types

Country Rate

TL/RR/USD

Example

Labourer: TL

111 Hour-

RR 1300 hour

USD 20 hour

Material Rates:

Historical – Web – Percentage

Database Check % of Cost

Operating Equipment Rates:

Equipment Type

Monthly/Hourly

Production

Examples:

Caterpillar or

Case



Estimating Methodological Differences: International Rate Development

```
Crew 1 - Concrete

2 Labourers - $13 * 2 = $26 – 16 Hours

1 Carpenter - $20 - 8 Hours

1 Ironworker - $24 - 8 Hours

1 Foreman - $31 - 8 Hours
```

Crew is 40 Hours a Day - \$101

```
Crew 2 – Piping

1 Labourer - $13 - 8 Hours

3 Pipefitters - $25 * 3 = $75 - 24 Hours

1 Welder - $30 - 8 Hours

1 Foreman - $31 - 8 Hours
```

Crew is 48 Hours a Day - \$149

	Com	posite:
Labourer	\$13	
Carpenter	\$20	
Millworker	\$27	
Pipefitter	\$25	
Welder	\$30	
Cement Mason	\$22	
Brick Layer \$22		
Operating Engine	er	\$28
Electrician \$25		
Ironworker \$24		
<u>Foreman</u>	\$31	
Step 1 Add all Rat	es Tog	gether
13+20+27+25+30	+22+2	2+28+25+31 = 267
Step 2 – Divide by	/ Num	ber of Rates
267/11 = \$24.27	Comp	osite Rate



Estimating Methodological Differences: Differences Issues

- Norms are so far out of date (2001)
- Factoring has been compounded for 17 Years
- Locations (5) are Utilized for the normative
- Calculation Methods Norms vs Calculations
- Indirect Calculations Russian Formula vs
 International of % of Cost or Schedule * Rate
- Contingency Russian 3% to 0 versus 10 to 25%
- Accuracy of Documentation
- Estimator Independence



Recommended Associations

- http://www.planningplanet.com/guild
- www.projectcontrolsinstitute.com
- www.acoste.org.uk/
- www.rics.org
- www.aace.pro



Thank You!!!

Dr. Sean T Regan, FAACE, CCP, CEP, EVP, PSP, MRICS, FPG

Marketing Director Region 2 ICEC

President International Operations

sean@ontrackpm.com

www.ontrackpm.com

sean@lgm-international.com

www.lgm-international.com

+17023387687 - US Cell

+420775226608 - CZ Cell

