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REPLY TO: 1750 Emerick Road, Cle Elum, WA 98922 USA

Is Ethics Dead in Project Controls Management?

By: Kris R. Nielsen, Esq., PMP, MRICS[i]

Not until the 1950's was Project Management recognized as a separate management function and specialized management methodology different from management methods employed in government or corporate business. Now, half a century later, Project Management has evolved into global standards that are generally accepted and employed. Approximately fifty years ago Critical Path Method (CPM) scheduling burst on the world's project scene. It was a method of logically diagramming the relation between the activities that had to be done to accomplish an end result and methods for mathematically determining the longest path to their accomplishment. To use it, however, one had to laboriously hand calculate the relationships – finish-to-start – and its use was limited to several hundred "activities." When the mathematics was adapted to computerization, the number of activities and the relationships greatly expanded. CPM scheduling progressed rapidly.

Almost hand in hand with this new tool, Project Management began to flourish and the new management science began to grow. The tool provided Project Managers with more and more information. Project Managers demanded even more, once the reporting gave them what they wanted. By the early 1970's we were using the power of mainframe computers to process schedules. The role of Project Controls in providing the information that Project Managers demanded in order to fulfill their mission was borne. A linkage of estimating, scheduling, and project cost was demanded. In 1973 a 28-year old engineer forecast the future before a National Academy of Engineering and Building Research Institute conference when he predicted the future of project controls and what it would mean for the future role fulfilled by project managers.[ii] He had just combined computerized estimating, CPM scheduling, and was combining the McDonnell Douglas' COPES system for cost reporting to formulate the Federal Government's new Construction Management Control System (CMCS). He forecast that the complete needs of project management would be met by relational data bases tied to vastly

PRINCETON, NJ, USA
Tel: +1 (609) 497-7300
Fax: +1 (609) 497-3412
E-mail: njnwg@aol.com

SEATTLE, WA, USA
Tel: +1 (206) 386-5250
Fax: +1 (206) 386-5252
E-mail: seattlenwg@aol.com

SAN DIEGO, CA, USA
Tel: +1 (858) 638-9440
Fax: +1 (858) 638-9451
E-mail: canwg@aol.com

HOUSTON, TX, USA
Tel: +1 (713) 917-6888
Fax: +1 (713) 917-6889
E-mail: houstonnwg@aol.com

FAIRFAX, VA, USA
Tel: +1 (703) 691-7800
Fax: +1 (703) 691-8377
E-mail: fairfaxnwg@aol.com

PUNTA GORDA, FL, USA
Tel: +1 (941) 637-9700
Fax: +1 (941) 637-8380
E-mail: floridanwg@aol.com

MELBOURNE, AUSTRALIA
Nielsen-Wurster Asia-Pacific Pty. Ltd.
Tel: +613 9639 2844
Fax: +613 9639 8955
E-mail: asianwap@aol.com

advanced computers. Whole projects would be available within ten years to the project teams in progressively more detail from planning through commissioning.

Within a matter of years the nuclear industry had whole teams devoted to maintaining resource loaded schedules with 30,000 activities. Aerospace had larger schedules as the space program was accelerating and we explored the moon. It required large mainframe computers to handle, develop, and report on the volume of information that steadily became available to Project Managers. And by the end of the 1970's scheduling was regularly used by a new breed of consultant to demonstrate what had been planned and what had occurred to show objectively the extent or the lack of impacts. The courts and arbitrators began to be exposed to battles of experts that would become the norm within a matter of years.

Even the process of designing and constructing an infrastructure project in Milwaukee composed of 150 separate construction projects costing $1.2 billion required complex project controls so that the Program Master Scheduler reported on progress toward achieving federal court mandated compliance with environmental clean-up. This situation was a first for a court. CPM schedules and the other resource reporting were used to keep the federal judge cognizant of the progress – and that was the job of the Chair of this very conference!

As the 1980's began there were two widely used software programs globally: Artemis and P2. The platform for the programs was a dedicated "Minis.' Project Controls was used as forecast to provide information that was used to integrate a wide host of project information. The projects ranged in application from defense to pharmaceutical research projects, to oil & gas development and power plant outages, to Architect/Engineer planning and building construction projects. All these projects were driven by a recognition that the planning, monitoring and execution process that made up project management depended on timely information that the Project Controls function provided.

In the mid 1980's two developments would change the Project Controls milieu forever. The Personal Computer (PC) was invented and Primavera (P3) was introduced to the Project Management community. In the twenty years since, the PC has reached computing scale that was unimagined. Today a typical PC is more powerful than the mainframes that that were

housed in their own buildings! Primavera surpassed the capabilities of prior systems. With each new release, schedulers and Project Controls staffs were able to handle the infinite variety of scheduling challenges, calendars, resources, etc. Project Controls personnel can carry around in their laptop hundreds of schedules that they can call up in a minute and play "20 questions" type games that can be presented through various filters. The information can control almost limitless data files of information and can control the amount of resources needed, available, or planned. It is a Project Managers dream. With P3, Project Controls can produce and analyze vast volumes of data – just about anyway a Project Manager can visualize or want information displayed.

So by 1986 Project Controls information was being used to defend billions of dollars of costs in nuclear plant construction, a role that was not contemplated at first.[iii] Thereafter, the use of the information became a regular part audit reviews of projects and programs, whether in the private or the public sector, and it the use of Project Controls has spread internationally.[iv] The definition of what Owners wanted was addressed with the development of the complete capability that the PC, P3, and complimentary systems enabled. As the methods of project delivery evolved in the age of Project Management, so too did the needs of project information produced the Project Controls group for Project Management. Today, Project Controls information is essential in dealing with issues of corporate governance.[v] The providing of project information is essential at all levels of government and corporations, it is simply indispensable and a given in today's project environment.

Early in the 1980's the Project Management Institute (PMI) also took a bold step forward. The PMI had assembled standards that were compiled into knowledge areas. It reflected what was generally used and accepted industry practices in their Project Management Body of Knowledge (PMBOK). PMI explored what made a professional. Webster's dictionary defines a professional as being a person who is "*characterized by or conforming to the technical or ethical standards of a profession.*"[vi] Engineers, for example, are a recognized professional by this definition. You demonstrate core educational competence by taking the FE (Fundamentals of Engineering) Exam. After successfully passing the FE Exam, and after at least four years practicing, an individual takes the PE (Professional Engineer) Exam that demonstrates his or her ability to minimally apply the best of engineering practices. Once you pass the exam, you are allowed to

use the designation “P.E.” following your name. The “Professional Engineer” designation is recognition that you have demonstrated an ability to apply engineering that the public can rely upon to protect people and property.

So in 1984 there began the process of certifying individuals that possessed competence and practice in arena of Project Management. The public or an employer then could rely on the professionalism of individuals meeting minimal standards and the also protect against waste, deception or fraud in projects. You had to demonstrate prerequisite basic knowledge through a P.E. or a period of demonstrated practice. Then you proved your ability to meet at minimum the best practices that made up the PMBOK in applying knowledge specific to project applications. You received the designation of “PMP” or Project Management Professional after you swore to practice Project Management with “*responsibility to … act in an accurate, truthful and complete manner, including all activities related to professional work*….”[vii] The first class of “PMP’s” successfully took the certification exam in 1984. There were approximately 50 PMP’s sworn in 1984. Today, 21 years later, there are approximately 130,000 PMP’s, and the number climbs globally each month.

In the early years PMBOK practices revolved around the great information base that Project Controls provided those who practiced project management. It reflected the great leaps forward in information that could provided. At first it was professional pride in the ability to provide projects with information. Almost more information than the Project Manager team could absorb or even use. Project Controls personnel took pride in providing arbitrators and courts with the ability to objectively compare planned and actual data, and interpret what it meant. Then university research began the proper evolution of the “softer” side of Project Management: Organizational Theory, Human Resources, Communications, Risk Management, etc. The PMBOK was updated to reflect the evolution several times. As this century begins, the focus has shifted to reflect another evolution – the management of *a group of projects organized as the Organizational Project Management Maturity Model (OPM3) as a PMI standard*…(since) *project management involves more than the skillful and competent management of individual projects. It also requires a set of the systems, processes, structures and capabilities that enable an organization to undertake the right projects, and to support them organizationally.*”[viii] Project Management has also encompassed the professionalism of an organization in the execution of

programs of projects to be managed by the generally accepted and best of industry practices. Project Controls must now incorporate new levels of information for multiple projects that an organization engages in. PMBOK continues to evolve and encompass a growing knowledge base and the professional "bar" is raised yet again. By our re-certification prove that we are still worthy of the recognition as a PMP and we are capable of minimally protecting our organizations, our projects, and objectively present differences from what we planned.

But inherent in Project Management and its practice is still the knowledge of the need for information, the back bone that is provided by Project Controls. With five decades of practice behind us, what was the years of practice improvement in project information provided by Project Controls has transitioned to development of information in every project that is available from systems like P3 and the use of the PC's. We are applying generally accepted and the best of industry practice in the PMBOK knowledge areas. The Project Management Institute's College of Scheduling (PMICOS) is defining are best practices that encompassed in PMI's knowledge areas. We have truly achieved what I prophesized in 1974 as expected standards.

Now given this great story of accomplishment, I raise a question that we must all answer. **Is ethics dead in project controls management?** In the last ten years, what has evolved into standard practices is serious jeopardy. It had its genesis about ten years ago. Owners wrote very sophisticated scheduling specifications and placed on the contractors the burden of providing detailed project information that fulfilled there needs. The contractors had to either "gear up" to provide the information or hire subcontractors who have the expertise. Unfortunately, many Owners did not need all the information and did not have the staff to even review the information that they demanded. And, the Contractors had people they now engaged that had time to fulfill another agenda. With only "thin" margins available to them, some Contractor's Project Controls staffs began to play games with the Project Controls information that Owners demanded. They did not merely prove conclusively differences that occurred during execution, but began to "creatively" hide their issues and enhance the Owner's issue. Conversely, some Owners could afford to analyze the detailed Project Controls information they demanded which

was not what the Contractors needed to manage the Projects. Some Owners got so much information there could “interfere” in what was the province of the Contractor or make changes that they said had no impact for Contractor. The Contractors often use two sets of Project Controls information. Either to deceive or to truly obtain the Project Controls information it needs to accomplish the Project. Similarly, where the Contractors have failed to win this game of brinkmanship with Owners, they had resorted to taking on their significant subcontractors or vendors in a similar manner. So today we are faced the era of “gamesmanship.”

I would like to raise with you some of the abuses with scheduling and their application as used by Project Controls personnel – both offensively and defensively – that I have witnessed with a growing frequency. Scheduling is the basis of most Project Controls approaches. And the misinformation that is coming forth from projects is catamount to fraud. Let me give you some examples of what I am observing. Unfortunately, they cut across all types of projects and are found globally.

I’ll refer to the first example as the matter of “20,000 constraints.” The project was a large infrastructure project, a Greenfield toll way – one of the largest infrastructure projects built in that country since the Second World War. It was a Public Private Partnership or Public Finance Initiative (a delivery method to finance public works projects or services through use of private sector capital). The government only had a limited number of risks that it retained – basically either cost or delays caused by other branches of government, or a change in the performance requirements. All other risks were on the concessionaire and its partners, the design and construct contractors. The government required the delivery of the project to be statused through monitoring of Project Controls reports that included a detailed P3 schedule. The contractor submitted a detailed 5,000 activity schedule for the baseline schedule. After about a year the Concessionaire and its contractors claimed delay and asked to re-baseline the schedule because it had essentially finished the detailed design and admitted some project delay

at the project commencement that it alleged would cause 6 months of delay. The government had itself some responsibility for delay and granted a six month extension, and allowed the contractor to submit a new base line schedule. When the schedule was submitted it contained a further 15,000 activities. The schedule met the letter of the extension of time and the specification for the Project. The Owner was overwhelmed. It was a complex project, but he did not have the staff to evaluate the detail – merely the concession milestone dates. Another nine months and the contractor submitted another extension of time request and demonstrated that the government was the cause. He used the expanded schedule. The government did not accept the extension of time, but granted the Concessionaire and the contractors their wish to submit a revised baseline that reflected the "re-sequencing" it would have to undertake in its attempt to recover the lost time – an alleged acceleration. The P3 schedule it now submitted had 30,000 activities.

The government knew that something was wrong, but did not know how to analyze such a huge schedule. The government was at a loss. The government turned to a consultant. The consultant found a schedule that contained over 20,000 mandatory and discretionary constraints. It required months of intense of intense analysis to ascertain want the contractor had done. There were a number of relevant constraints – less than 200. There were about 2000 discretionary constraints that had reasonable scheduling explanation. That left over half the activities with constrained dates that had to be analyzed. The analysis undertaken found that the critical and near critical paths were not the real ones, but had been skewed to show non-critical and non-near critical paths as critical with the constraints in place. These skewed paths all contained some activities where government actions were required. The resultant paths no longer had float. Delays were all the risks that the government retained. The actual critical and near critical paths that no longer showed they were critical contained activities where the contractors was experiencing delays and for which he was responsible. The multiple claims were so discrete that it also masked the real delays. At the conclusion of the job,

the contractor made a large claim. The government demonstrated during the negotiations, with the constraints removed, how the contractor had manipulated the schedule and the claim was settled for what the government legitimately had caused the contractor.

The contractors had retained a Project Controls consultant who had suggested this route when the contractor faced rising costs. The contractor's Project Controls personnel with the knowledge of the contractor and in league with the consultant used the scheduling to attempt to defraud the government. The government was totally unprepared, perhaps even incapable, of meeting such activity. The contractor attempted to make up what it was loosing from risks that he had legitimately taken on by demonstrating impacts he had not incurred.

The second example involved a complex expansion of an institutional building project and reflected logic manipulation. The project participants were an agency construction manager, separate contractors, an uninvolved owner, and phased construction with sequenced sub-phases. The construction manager's agency was an advisor only to the owner. A particular phase contractor had an eight month schedule to perform its work, which was critical to the follow-on phases. The contract required a P3 schedule, with monthly updates and included a requirement that any delays which the contractor was experiencing be highlighted, the manner in which the contractor was going to recover the delays, and any logic changes that were made to the schedule. The submitted schedule had 2000 activities. The contractor experienced some early delays, and the owner had made some minor changes. The contractor in violation of the specifications did not report monthly. The contractor did, however, insert activities which it alleged would entitle him to an extension of time. In the fourth month of the project, the contractor removed the extension of time activities, and submitted the statused schedule. In the fifth month of the project, when the statused schedule was submitted, the contractor did not report that it had made logic changes to the schedule. The owner

and the construction manager did not catch the changes, which forced the critical path away from the contractor problems to activities and paths which conceptually could have entitled it to an extension of time. When the contractor still did not recover, it was terminated. In a suit over wrongful termination, and following extensive analysis of the schedules, it was found that the contractor's Project Controls staff had manipulated the schedules.

The manipulation was not easy to spot. The techniques used were varied and complimentary. The actual extent of the manipulation was found after months of convoluted analyses. The key elements of what had been done were:

- Certain activities well out in the future had successor logic links removed with no apparent reason. These links were a "distracter," something that was easy to spot, and remove, but not the real manipulation, so that the delaying results were lessened but not eliminated.
- Logic links were changed between activities so that works in geographically diverse paths were linked in apparently sound fashion. It was work that would be logically linked – the work was similar, but so geographically separate that it was not actually a part of the path. This had the effect of linking sub-phases and driving the non critical sub-phase to criticality.
- The major manipulation was to submit status as progressed. In fact certain sub paths were actually reported under a "retained logic" relationship. When combined, the schedule that was ostensively "progressed," and it created artificial critical paths.

This manipulation was done by a skilled scheduler. The owner had put all the right requirements in the specification, but did not empower its construction manager and did not have the resources to use the information that he required. The contractor almost got away with it.

The third example is a process plant. It was a Greenfield site and used a technology was a substantial increase over a prototype sized installation. The multi-national lump sum turnkey

contractor was sued for a “bet-the-company” amount. The contractor was unable to get the process to work – it was a proprietary technology developed and owned by the Owner. In a suit over the design-construction execution period, the two scheduling experts had different results based upon the same schedule. The testifying experts in an international arbitration were both PMP’s. The schedule contained 7,000 activities and was updated monthly. Both experts performed a “Windows Analysis.” Finally, the owner’s expert was shown to have manipulated the schedule.

The owner’s expert alleged the contractors had over reported progress and when it compressed the schedule in response to the owners demand, the contractor was defrauding the owner into making acceleration payments. The manner in which manipulation was accomplished was shown by the contractor’s expert after months of extensive analysis. In a path that was well outside of the window, the owner’s expert had changed a relationship in an obscure activity. He changed to a “finish to finish” relationship that the contractor had in his scheduled “finish to start” and then reported an artificially extended duration for the activity. The contractor’s expert finally identified the activity and duration, and owner’s expert was forced to admit to the change during cross examination. We can only speculate as to the reasons why. The CEO who was involved from the owner was summarily fired, and the stock took a big hit.

The fourth example is the most extensive of manipulations. The project is a massive infrastructure project that is now underway. Following today’s trend, it is also a project performed under pursuant to a Public Finance Initiative. The early base line schedule contained 3,500 activities and was approved by the owner and the concessionaire. The early part of the project was fraught with the EPC contractor’s design delays and by changes to the owner’s and concessionaire’s requirements. After one year, the contractor was granted an omnibus extension of time for the nine months he had requested, and a new baseline schedule of 5,000 activities developed and agreed by the parties. Thirteen months further into the project, the contractor is claiming that the completion date would be delayed by 18 months. The contractor submitted in compliance with its contract a detailed schedule that demonstrates the delay. The contractor’s monthly reports stress that it has added detail to previously approved hammock activities. The contract specification requires him to report additions, logic changes, etc.

The Owner/Concessionaire's analysis of this schedule demonstrated that the negative float in the longest paths demonstrated the delay. In fact the paths critical paths are ones were the owner and the Concessionaire may have some responsibility. The contractor was added almost 1,000 additional activities to reflect additional detail in originally. What the contractor's did not report was that it had changed the logic in 5,400 of the 5,900 activities. The contract then extended durations wherever it was experiencing problems – and the extended durations were not minor, increases from 10 to 20 times the duration. Conversely, it shorted other duration, such as, weather contingency to 10% of the baseline schedule's value. You simply could not tell because of the start-to-start relationships. Where there was seemingly sound logic, there were over fifty activities with a finish-to-start with a significant negative lag. When the owner suggested that the logic changes were extensive, the contractor merely said there may be a few errors or sloppy programming, but the schedule was sound. When analyzed the contractor had also built the schedule with 39 separate calendars the further made the schedule a nightmare to analyze.

The contractor's manipulations after extensive analysis had changed the critical paths from the non-critical paths, and to ones for which there was potentially owner culpability. The actual critical paths were ones that the contractor was experiencing delay because of its own issues. The end result was to require the schedule to be statused against the approved baseline, and the re-status months of the schedule to reflect true progress.

Now what do these examples tell us. They are not unusual, but they are not the norm. Hardly a month goes by that I do not see abuses of Project Controls reporting and manipulation of schedules to demonstrate one position or another. There may be many reasons, but the truth is that there appears to be no ethics in Project Controls. Is the future to be one of forensic members in Project Controls staff? Will we assume that the owner is going to demand more of something that is not useful and that contractors will be skilled in covering their tracks and proving everything the owner does is a problem? We have become adept at "gamesmanship." Project Controls has now evolved into telling stakeholders what they want to see or what they want to hear. We are facing a crisis of professionalism. We are becoming more adept are manipulating and not presenting the facts to enable fair resolution of issues.

So my challenge to you is to ask one final time: **Is ethics dead in project Controls management?** Are we as practitioners going to apply excellence to improvement of the process? We can make a difference. PMICOS is a step in the right direction in the pursuit of this excellence.

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[i] Mr. Nielsen is the Chairman of the Board of the Nielsen-Wurster Group, Inc.
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