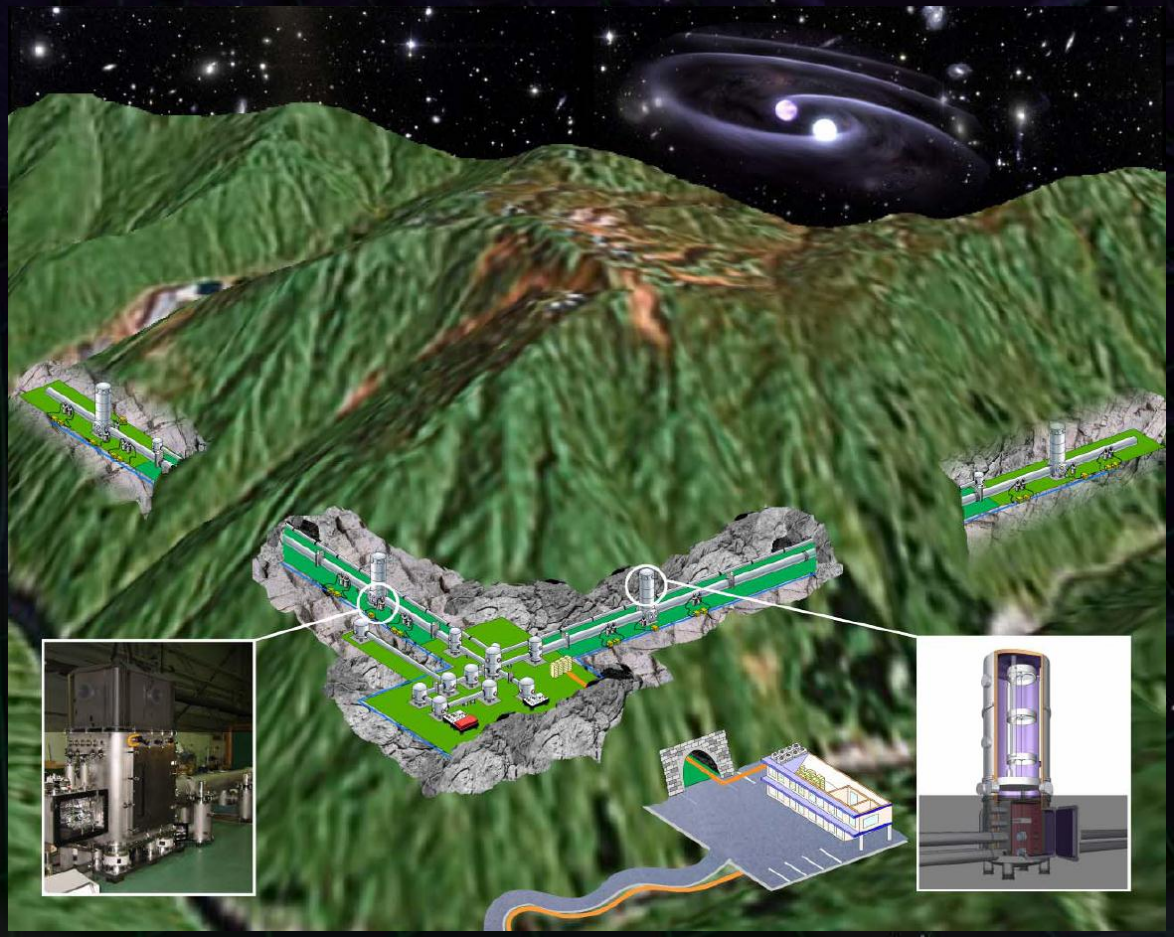
KAGRA Risk Management



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Risk Management

- Potential risks are important information for the project management.
  - Careful progress evaluation for major risk factors.
  - Back-up plans to minimize project delay.
  - Effective distribution of project resources.
  - Clarify and remind risks → good mitigation?

'Necessity is the mother of invention'

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Technical and schedule risks by each subsystem are being summarized up by SEO.

Risk Management Activities

- Collect risk information from subsystems (Feb. 2012 -).
- Summarize them and present at PAB (Feb. 23).
- Some suggestion from PAB members.

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- Visit P. Grey (TMT sub-PM, Risk management leader) to hear about the TMT risk management (March 5).
  → We found that our concept is similar, but TMT is more systematic.
  - Regular risk meetings ~ every 3 months.
  - Web-based system developed in TMT.

- Risk meeting by subsystem + SEO (April. 2).
- Updating the risk information.

KAGRA Risk Register

- Risk information from subsystem.
  - Total ~150 risks (~10 risks for each subsystem)
  - Risk ID, Item, Explanation, Impact, Mitigation/Back-up plan, and Quantitative evaluation

Probability P	0 The probability is extremely low and will almost never occur.
	1 The probability is not large and will probably not occur.
	2 The probability is around 0.5.
	3 The probability is large and will probably occur.
Seriousness S	0 It will not affect the successful completion of the project.
	1 It will to some degree affect the successful completion of the project.
	2 It will to some degree endanger the successful completion of the project.
	3 It will result in the failure of the project.
Degree of risk	R = P x S.

- Summarized in a simple Excel file.
- First version summarized → update is required:
  Impression of subsystems, Japanese/English mixed.

KAGRAリスク要因 (KAGRA Risk Factors)

2012.3.12

仮ID	No.	サブシステム Subsystem	項目 Item	説明 Explanation	インパクト Impact	対応 Design/back-up plan	P Likelihood of Probability	S Degree of Serious ness	R Degree of Risk	Selection MA	Selection KS	Selection SM	情報元 Source
TUN-1	1	トンネル Tunnel (TUN)	静穏環境	期待しているほどの静穏環境が得られない。地面振動や多量の地下水による音響雑音、大気環境など。	望遠鏡の安定度・感度の劣化。	各サブシステムの性能向上。防音敷音等の充実。							SEO
TUN-2	1	TUN	避難経路の確保	X-endからの避難経路が確保されていない。	重大な危険。					10		10	Int.Rev.2012
TUN-3	1	TUN	掘削完成遅れ	掘削完成遅れ	全体スケジュールに影響有り。	掘削業者がすべての責任を持つ。				10			Uchiyama Feb. 14
TUN-4	1	TUN	防振用横穴位置ずれ	防振用の横穴掘削位置が設計値からずれる。	全体設計に影響有り。	測量を正確に行う。防振グループは余裕のある設計を行っておく。							Uchiyama Feb. 14
FCL-1	2	施設 Facility											
VAC-1	3	真空 Vacuum (VAC)	真空リーク	真空系のリーク	干渉計安定度・感度の低下。ダクトにリークが起きた場合には、真空復帰に1ヶ月以上を要する。	ダクトに取り付けられたイオンポンプ等は真空を破ることなく交換可能なように、バルブを取り付けておく。							Int.Rev.2012 Saito Feb. 14
VAC-2	3	VAC	イオンポンプの寿命	Ion pump replacement is once per 5 years when operated at 10-7 Pa	not serious; replacing without breaking arm vacuum.								Saito Feb. 14
VAC-3	3	VAC	ゲージの故障	contamination for first one year operation, then the probability will	not serious; replacing without breaking arm vacuum.								Saito Feb. 14
VAC-4	3	VAC	ガスケット等	Erroion of gasket and electric feed-through may happen; probability is unknown although humidity test has shown no erroion.	serious if the erroion takes place in the arm. one month is necessary for recovering vacuum.								Saito Feb. 14
VAC-5	3	VAC	窓板等の破損	View port crack or fracture may happne; the probability is much higher in a window of 200 mm in diameter, or more.	serious. one month is necessary for recovering vacuum. windows of 100 mm in diameter, or shorter, is preferable.	修復後再度真空引きを行う。						10	Saito Feb. 14
VAC-6	3	VAC	大規模真空リーク	大きな真空リーク。								10	Int.Rev.2012
VAC-7	3	VAC	真空内部品の材料	真空槽内に置かれている部品材料からの、ガス放出・発塵・油脂性分干渉計の汚染および系内の圧力上	干渉計感度の低下	真空サブグループによる使用材料・部品の査定。場合によっては、試験・測定を予め行なう。							Saito Feb. 18

Summary

- We are summarizing risk factors
  → Basic information for the project management.

- First version is almost finished.
  →Details will be shown in subsystem presentations

- Continuous update and remind are important.