Health and safety policy in french quarries and UNPG action

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UNPG

Health and safety policy in french quarries

The 2700 French quarries are submitted to a specific regulation : RGIE

"Réglement Général de l'Industrie Extractive"

Health and safety policy in french quarries

RGIE has 11 titles

General rules

Noise

Electricity

Dust

External contractors

Individual protection equipments

Working equipments

Explosives

Ionizing radiations

Working and walking up in height

Vehicle on track

Health and safety policy in french quarries

And will have a twelfth one :

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Exposure to vibrations

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Health and safety policy in french quarries

Dust

3 objectives :

To **reduce the dust emission** during materials quarrying, processing and transport

To make the **workers aware** of the prevention of risk linked to the dust inhalation and to the effects **on their health**

To implement the **good practices**

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Dust

When the respirable dust contains more than **1 % silica, it is compulsory** :

To check every 2 years, once in summer, once in winter, and to report in a medical file **the exposure of each job to crystalline silica dust** :

< 0,25   mg/m^3 classe 3
< 0,125   mg/m^3 classe 2
< 0,0625 mg/m^3 classe 1

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Dust

These objectives meet the objectives of the **NePSI**

But are missing and are presently presented by UNPG to its members, especially **the little ones** :

⇨ the specific **risk management** at the level of each site and of the staff himself ;

⇨ the specific **reporting** at the level of each site, of each firm and of the UNPG itself.

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RGIE

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Exposure to vibrations

The directive 2002/44/EC on the minimum health and safety requirements regarding the exposure of workers to **whole body vibrations**

will be next July the twelfth title of RGIE.

How to explain and implement it in each quarry and on each building site ?

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Exposure to vibrations

The **EU Good practice Guide on Whole body vibrations** is usefull but its 64 pages are hard to read and to implement in the medium and little sites

The **Caterpillar pocket Guide** is more adapted to medium size companies

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Exposure to vibrations

UNPG and the french contractors association (FNTP) decided to publish a little 8 pages booklet, with an adapted method for :

⇨ **assessing** the exposure to vibrations A(8) on each machine ;

⇨ Helping to **decide** what to do for reducing it.

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Exposure to vibrations

- In 2004 UNPG asked PREVENCEM (*a body for prevention in quarries*) and INRS (*french industrial health institute*) to start vibration measurement in quarries

- End 2006 more than 500 results obtained in quarries and building sites were available.
- They were introduced in the technical report ISO TR 25398: 2006

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Vibration measurement results

Machine family	Mean equivalent acceleration a_{eq} m/s^2
Wheel scrapper	1,2
Articulated dumper	0,95
Rigid dumper	0,85
Wheel loader	0,9
Wheel excavator	0,65

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Exposure to vibrations

a - Equivalent acceleration a_{eq} estimation

- Retain the mean equivalent acceleration a_{eq} given for the machine

- **Add a scenario factor of 0,25 m/s2** if the machine works in bad conditions : at least **2** of the 6 following items are pointed out.

Exposure evaluation

The 6 bad conditions items

1. The machine moves on damaged tracks (potholes)

2. No speed limit signs in damaged areas of the track

3. The size of handled particles > 1 m

4. Seat not conforming to ISO 7096: 2000

5. Seat damaged or more 4 years old without any check

6. Driver not specifically trained

Exposure evaluation

a - Equivalent acceleration a$_{eq}$ estimation

- If the machine works in good conditions **substract a scenario factor of 0,25 m/s²** from the mean equivalent acceleration a$_{eq}$ given for the machine

Exposure evaluation

b –Working time T evaluation

- The working time T is evaluated by substracting the vibration breaks during the working day

Exposure evaluation

c – P$_E$ Exposure points determination

- P$_E$ Exposure points are deducted from a$_{eq}$ and T with the aid of the following chart

Exposure evaluation

c – P$_E$ Exposure points determination

For example : a rigid dumper moves 6 hours a day on

- damaged tracks
- with big particles > 1 m
- His seat is 6 years old without any check
- The driver is not specifically trained

a_{eq} = 0,85 + 0,25 = 1,10 m/s^2

T = 6 h

PE Exposition points

Equivalent acceleration a_{eq} m/s^2

$P_{Etot} = 363$

a_{eq} m/s^2	15 m	30 m	1 h	2h	3h	4 h	5 h	6 h	7 h	8 h
1.5	28	56	113	225	338	450	563	675	788	900
1.45	27	53	105	210	315	421	526	631	736	841
1.4	25	49	98	196	294	392	490	588	686	784
1.35	23	46	91	182	273	365	456	547	638	729
1.3	21	42	85	169	254	338	423	507	592	676
1.25	19	39	78	156	234	313	391	469	547	625
1.2	18	36	72	144	216	288	360	432	504	576
1.15	17	33	66	132	198	265	331	397	463	529
1.1	15	30	61	121	182	242	303	363	424	484
1.05	14	28	55	110	165	221	276	331	386	441
1	13	25	50	100	150	200	250	300	350	400
0.95	12	23	45	90	135	181	226	271	116	361
0.9	10	20	41	81	122	162	203	243	284	324
0.85	9	18	36	72	108	145	181	217	253	289
0.8	8	16	32	64	96	130	160	190	222	255
0.75	7	14	28	56	84	113	141	168	196	225
0.7	6	12	25	49	74	98	125	145	170	195
0.65	5	11	21	42	63	85	106	126	147	169
0.6	5	9	18	36	54	72	90	108	126	144
0.55	4	8	15	30	45	61	76	91	106	121
0.5	3	6	13	25	38	50	63	75	88	100
0.4	2	4	8	16	24	32	40	48	56	64
0.3	1	2	5	9	14	18	23	27	32	36
0.2	1	1	2	4	6	8	10	12	14	16

Working time T

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Exposure evaluation

e – Daily exposure evaluation

- Compare P_{Etot} to :
    - the action value : 100 points (0,5 m/s^2)
    - the limit value :529 points (1,15 m/s^2)

- Interpolate P_{Etot} in the column 8h of the chart and read the total daily exposure A(8) in m/s^2

Equivalent acceleration a_{eq} m/s²	15 m	30 m	1 h	2h	3h	4 h	5 h	6 h	7 h	8 h
1.35	23	46	91	182	273	365	456	547	638	729
1.3	21	42	85	169	254	338	423	507	592	676
1.25	19	39	78	156	234	313	391	469	547	625
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0.6	5	9	18	36	54	72	90	108	126	144
0.55	4	8	15	30	45	61	76	91	106	121
0.5	3	6	13	25	38	50	63	75	88	100
0.4	2	4	8	16	24	32	40	48	56	64
0.3	1	2	5	9	14	18	23	27	32	36
0.2	1	1	2	4	6	8	10	12	14	16

Working time T

$A(8) = 0{,}95 \text{ m/s}^2$

What to do for reducing it

- Repair and further maintain the tracks
- Reduce the particle size by better controling the blast
- Check the seat and eventually change it
- The driver is specifically trained

$a_{eq} = 0,85 - 0,25 = 0,6 \ m/s^2$

$T = 6 \ h$

PE Exposition points

Equivalent acceleration a_{eq} m/s^2

$P_{Etot} = 108$

a_{eq}	15 m	30 m	1 h	2h	3h	4 h	5 h	6 h	7 h	8 h
1.5	28	56	113	225	338	450	563	675	788	900
1.45	27	53	105	210	315	421	526	631	736	841
1.4	25	49	98	196	294	392	490	588	686	784
1.35	23	46	91	182	273	365	456	547	638	729
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0.5	3	6	13	25	38	50	63	75	88	100
0.4	2	4	8	16	24	32	40	48	56	64
0.3	1	2	5	9	14	18	23	27	32	36
0.2	1	1	2	4	6	8	10	12	14	16

Working time T

UNPG

Assessed exposure to vibrations on that rigid dumper :

Equivalent acceleration a_{eq}^2 m/s²

	15 m	30 m	1 h	2h	3h	4 h	5 h	6 h	7 h	8 h
1.35	23	46	91	182	273	365	456	547	638	729
1.3	21	42	85	169	254	338	423	507	592	676
1.25	19	39	78	156	234	313	391	469	547	625
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0.75	7	14	28	56	84	113	141	168	196	225
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0.5	3	6	13	25	38	50	63	75	88	100
0.4	2	4	8	16	24	32	40	48	56	64
0.3	1	2	5	9	14	18	23	27	32	36
0.2	1	1	2	4	6	8	10	12	14	16

Working time T

$A(8) = 0,5$ m/s²

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Conclusions

Till now the safe and safety in french quarries is a matter of regulations (the 12 titles of RGIE)

The results are as follows ….

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Conclusions

	2004	2005
Industrial injuries with medical certificate	1043	938
Severely injured persons	13	20
Fatalities	6	4
Frequency rate Massive rocks	41	36
Sand and gravel	29	30

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Conclusions

A new policy of continuous improvement using social dialogue and good practice sharing is already implemented in the great groups with some results

The programme of UNPG is to diffuse that way of working to its more little members

The 2 UNPG actions about dust and vibration exposure are 2 examples of that new approach.